

FIG. 1

Nucleic Acid Sequences

A. predicted cDNA sequence of AtFtn2 (SEQ ID NO:1)
(synonym: At5g42480; synonym: *ARC6*) gene

Sequence length = 2406 nt

Start codon (ATG) is at position 1-3

Stop codon (TAA) is at position 2404-2406

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1   ATGGAAGCTC TGAGTCACGT CGGCATTGGT CTCTCCCCAT TCCAATTATG CCGATTACCA
61  CCGGCGACGA CAAAGCTCCG ACGTAGCCAC AACACCTCTA CAACTATCTG CTCCGCCAGC
121 AAATGGGCCG ACCGTCTTCT CTCCGACTTC AATTTACCTT CCGATTCTCT CTCTCCTCC
181 TTCGCCACCG CCACCACCAC CGCCACTCTC GTCTCTCTGC CACCATCTAT TGATCGTCCC
241 GAACGCCACG TCCCCATCCC CATTGATTTT TACCAGGTAT TAGGAGCTCA AACACATTTC
301 TTAACCGATG GAATCAGAAG AGCATTTCGA GCTAGGGTTT CGAAACCGCC GCAATTCGGT
361 TTCAGCGACG ACGCTTTAAT CAGCCGGAGA CAGATTCTTC AAGCTGCTTG CGAAACTCTG
421 TCTAATCCTC GGTCTAGAAG AGAGTACAAT GAAGGTCTTC TTGATGATGA AGAAGCTACA
481 GTCATCACTG ATGTTCTTGT GGATAAGGTT CCTGGGGCTC TCTGTGTATT GCAAGAAGGT
541 GGTGAGACTG AGATAGTTCT TCGGGTTGGT GAGGCTCTGC TTAAGGAGAG GTTGCTAAG
601 TCGTTTAAGC AAGATGTGGT TTTAGTTATG GCGTTGCGT TTCTCGATGT CTCGAGGGAT
661 GCTATGGCAT TGGATCCACC TGATTTTATT ACTGGTTATG AGTTTGTTGA GGAAGCTTTG
721 AAGCTTTTAC AGGAGGAAGG AGCAAGTAGC CTTCACCCGG ATTTACGTGC ACAAATTGAT
781 GAGACTTTGG AAGAGATCAC TCCGCGTTAT GTCTTGAGC  TACTTGGCTT ACCGCTTGGT
841 GATGATTACG CTGCGAAAAG ACTAAATGGT TTAAGCGGTG TGCGGAATAT TTTGTGGTCT
901 GTTGGAGGAG GTGGAGCATC AGCTCTTGTT GGGGGTTTGA CCCGTGAGAA GTTTATGAAT
961 GAGGCGTTTT TACGAATGAC AGCTGCTGAG CAGGTTGATC TTTTGTAGC  TACCCCAAGC
1021 AATATTCAG CAGAGTCATT TGAAGTTTAC GAAGTTGCAC TTGCTCTTGT GGCTCAAGCT
1081 TTTATTGGTA AGAAGCCACA CCTTTTACAG GATGCTGATA AGCAATTCCA GCAACTTCAG
1141 CAGGCTAAGG TAATGGCTAT GGAGATTCCT GCGATGTTGT ATGATACACG GAATAATTGG
1201 GAGATAGACT TCGGTCTAGA AAGGGGACTC TGTGCACTGC TTATAGGCAA ATGATTGAA
1261 TGCCGTATGT GGTGCGCTT AGACAGTGAG GATTCACAAT ATAGGAATCC AGCTATTGTG
1321 GAGTTTGTTC TGGAGAATTC AAATCGTGAT GACAATGATG ATCTCCCTGG ACTATGCAAA
1381 TTGTTGGAAA CCTGGTTGGC AGGGGTTGTC TTTCTAGGT TCAGAGACAC CAAAGATAAA
1441 AAATTTAAAC TCGGGGACTA CTATGATGAT CCTATGGTTT TGAGTTACTT GGAAAGAGTG
1501 GAGGTAGTTC AGGGTTCTCC TTTAGCTGCT GCTGCAACTA TGGCAAGGAT TGGAGCCGAG
1561 CATGTGAAAG CTAGTGCTAT GCAGGCACTG CAGAAAGTTT TTCCTTCCCG CTATACAGAT
1621 AGAAACTCGG CTGAACCCAA GGATGTGCAA GAGACAGTGT TTAGTGTAGA TCCTGTTGGT
1681 AACAATGTAG GCCGTGATGG TGAGCCTGGT GTCTTTATTG CAGAAGCTGT AAGACCCTCT
1741 GAAACTTTG AACTAATGA TTATGCAATT CGAGCTGGGG TCTCAGAGAG TAGCGTTGAT
1801 GAAACTACTG TTGAAATGTC CGTTGCTGAT ATGTTAAAGG AGGCAAGTGT GAAGATCCTA
1861 GCTGCTGGTG TGGCAATTGG ACTGATTTCA CTGTTGAGCC AGAAGTATTT TCTTAAAGC
1921 AGCTCATCTT TTCAACGCAA GGATATGGTT TCTTCTATGG AATCTGATGT CGCTACCATA
1981 GGGTCAGTCA GAGCTGACGA TTCAGAAGCA CTTCCAGAA TGGATGCTAG GACTGCAGAG
2041 AATATAGTAT CCAAGTGGCA GAAGATTAG TCTCTGGCTT TTGGGCCTGA TCACCGCATA
2101 GAAATGTTAC CAGAGGTTTT GGATGGGCGA ATGCTGAAGA TTTGGACTGA CAGAGCAGCT
2161 GAACTGCGC AGCTTGGGTT GGTTTATGAT TATACACTGT TGAACTATC TGTTGACAGT
2221 GTGACAGTCT CAGCAGATGG AACCCGTGCT CTGGTGGAAG CAACTCTGGA GGAGTCTGCT
2281 TGTCTATCTG ATTTGGTTCA TCCAGAAAAC AATGCTACTG ATGTCAGAAC CTACACAACA
2341 AGATACGAAG TTTTCTGGTC CAAGTCAGGG TGGAAAATCA CTGAAGGCTC TGTTCTTGCA
2401 TCATAA
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"Replacement Sheet"

FIG. 1 continued 2/6

B. Genomic sequence of AtFtn2 gene (SEQ ID NO:2 SEQ ID NO:3)
synonym: At5g42480; synonym: ARC6)

Sequence length = 3667 nt

This sequence contains 480 nt of the 5' and 149 nt of the 3' region

Start codon (ATG) is at position 481-483

Stop codon (TAA) is at position 3516-3518

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1   TGTTCCTGCAT TAAGGAGAAT ACAATTATAA GCAATTTGTC TTGATTTCAA CAAGATTTTG
61  CTTGGCTATA GGATTCATTG GCTCTGTTTG CTTTACATT TACATGTCAT AATAGTTTCG
121 AATTTTACAC ATTTTCAGTTG GATGTTAAGA AAAGAGAGGG AATTGATGGG GTTTTGTGGG
181 TTTAACTTTT AAAGTAGTCA AGAATTAAGT CATTGGTTTA CTGTTGCTCT ATATGTGTAA
241 AATGAAGGCA ACTCCAACGG TTCTTAGGTG GAATAGATTA TTTAGACGAT TTAACATCAT
301 AAAGTCCGTG GCGACTGTAA CATCATAGAT TGTTTTTTAT TTTTTCAGT AGCTGGTGAT
361 GTTTTTTGAT TTAACCTTATA CTACTCAAAA TCAAAAATTC ATAAACCCTA GACGACCAAA
421 CAGTCTCTTC AATATGTAAA ACAGAACAAA GTTTTTGTAG TAGCCTAAAA AGACACTCCC
481 ATGGAAGCTC TGAGTCACGT CGGCATTGGT CTCTCCCCAT TCCAATTATG CCGATTACCA
541 CCGGCGACGA CAAAGCTCCG ACGTAGCCAC AACACCTCTA CAACTATCTG CTCCGCCAGC
601 AAATGGGCCG ACCGTCTTCT CTCCGACTTC AATTTACCT CCGATTCTCT CTCCTCCTCC
661 TTCGCCACCG CCACCACCAC CGCCACTCTC GTCTCTCTGC CACCATCTAT TGATCGTCCC
721 GAACGCCACG TCCCCATCCC CATTGATTTT TACCAGGTAT TAGGAGCTCA AACACATTTT
781 TTAACCGATG GAATCAGAAG AGCATTGCGA GCTAGGGTTT CGAAACCGCC GCAATTCGGT
841 TTCAGCGACG ACGCTTTAAT CAGCCGGAGA CAGATTCTTC AAGCTGCTTG CGAAACTCTG
901 TCTAATCCTC GGTCTAGAAG AGAGTACAAT GAAGGTCTTC TTGATGATGA AGAAGCTACA
961 GTCATCACTG ATGTTCTTTG GGATAAGGTA ATTTTCGATT CGGAATAATA AAGTTTCTTC
1021 GTTTTAATTT CATGAATTGG ATAAAGGAAG GAACTTTTAT CTAGTGAAGG TTCCTGGGGC
1081 TCTCTGTGTA TTGCAAGAAG GTGGTGAGAC TGAGATAGTT CTTCGGGTTG GTGAGGCTCT
1141 GCTTAAGGAG AGGTTGCCTA AGTCGTTTAA GCAAGATGTG GTTTTAGTTA TGGCGCTTGC
1201 GTTTCTCGAT GTCTCGAGGG ATGCTATGGC ATTGGATCCA CCTGATTTTA TTAAGGTTTA
1261 TGAGTTTGTG GAGGAAGCTT TGAAGCTTTT ACAGGTAGTT TGAATTGCTT TGGAATTTTG
1321 ACGAGCGTTG GCTTTATAAG AACTTTCTTG ATTTGATACT TTGTTATTGA CTCTTGTGTA
1381 GGAGGAAGGA GCAAGTAGCC TTGCACCGGA TTTACGTGCA CAAATTGATG AGACTTTGGA
1441 AGAGATCACT CCGCGTTATG TCTTGAGACT ACTTGGCTTA CCGCTTGGTG ATGATTACGC
1501 TGCGAAAAGA CTAAATGGTT TAAGCGGTGT GCGGAATATT TTGTGGTCTG TTGGAGGAGG
1561 TGGAGCATCA GCTCTTGTG GGGGTTTGAC CCGTGAGAAG TTTATGAATG AGGCGTTTTT
1621 ACGAATGACA GCTGCTGAGC AGGTATACAG TTTAGATACC TTTTTTTAAT TTCTTTAGCA
1681 TGATATAACT TTAGGTTTCT CATTTTAATG TATGTTGTGT GGTAGGTTGA TCTTTTGTGA
1741 GCTACCCCAA GCAATATTCC AGCAGAGTCA TTTGAAGTTT ACGAAGTTGC ACTTGCTCTT
1801 GTGGCTCAAG CTTTTATTGG TAAGAAGCCA CACCTTTTAC AGGATGCTGA TAAGCAATTC
1861 CAGCAACTTC AGCAGGCTAA GGTAATGGCT ATGGAGATTC CTGCGATGTT GTATGATACA
1921 CGGAATAATT GGGAGATAGA CTTCGGTCTA GAAAGGGGAC TCTGTGCACT GCTTATAGGC
1981 AAAGTTGATG AATGCCGTAT GTGGTTGGGC TTAGACAGTG AGGATTCACA ATATAGGAAT
2041 CCAGCTATTG TGGAGTTTGT TTTGGAGAAT TCAAATCGTG ATGACAATGA TGATCTCCCT
2101 GGACTATGCA AATTGTTGGA AACCTGGTTG GCAGGGGTTG TCTTTCCTAG GTTCAGAGAC
2161 ACCAAAGATA AAAAATTTAA ACTCGGGGAC TACTATGATG ATCCTATGGT TTTGAGTTAC
2221 TTGGAAAGAG TGGAGGTAGT TCAGGGTTCT CCTTTAGCTG CTGCTGCAAC TATGGCAAGG
2281 ATTGGAGCCG AGCATGTGAA AGCTAGTGCT ATGCAGGCAC TGCAGAAAGT TTTTCCTTCC
2341 CGCTATACAG ATAGAAACTC GGCTGAACCC AAGGATGTGC AAGAGACAGT GTTTAGTGTA
2401 GATCCTGTTG GTAACAATGT AGGCCGTGAT GGTGAGCCTG GTGTCTTTAT TGCAGAAAGT
2461 GTAAGACCCT CTGAAAACCT TGAAACTAAT GATTATGCAA TTCGAGCTGG GGTCTCAGAG
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FIG. 1 continued 3/6

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2521 AGTAGCGTTG ATGAAACTAC TGTGAAATG TCCGTTGCTG ATATGTTAAA GGAGGCAAGT
2581 GTGAAGATCC TAGCTGCTGG TGTGGCAATT GGACTGATTT CACTGTTTCAG CCAGAAGTAT
2641 TTTCTTAAAA GCAGCTCATC TTTTCAACGC AAGGATATGG TTTCTTCTAT GGAATCTGAT
2701 GTCGCTACCA TAGGTATGAT TAAATGATGC AATTTTCATA TATCTGCATT GCTCAAAATA
2761 TGCTTGTTTT GTGAGCTAAG AACATAGTTC CCACTTAATA CATGTCCCAA AAGTTGTACC
2821 AAGATTAACA AGTTGCTGAG TAAATTTTAC TAATTATGCT GCTTGAATTT TTTGATCAAA
2881 CTGTAGACAG AAATGTAAAT TTCACTCTCA ACATTTCTGT TTAGAATAAC GTAGGATTAG
2941 AGATTGCCTT AGTGTGGCTT TGTCCAACCT TTCTTTCCCTT GATTTTTTTC TTTTCGATTT
3001 AGGGTCAGTC AGAGCTGACG ATTCAGAAGC ACTTCCCAGA ATGGATGCTA GGACTGCAGA
3061 GAATATAGTA TCCAAGTGGC AGAAGATTAA GTCTCTGGCT TTTGGGCCTG ATCACC GCAT
3121 AGAAATGTTA CCAGAGGTGA GGAATAAAT CTACAATTCA ATCAATTGTG TGA AAACTGT
3181 TGGACATGAT TATAGTCTGG TGCCTTGTTT GATTCTGTTA TTTATAGGTT TTGGATGGGC
3241 GAATGCTGAA GATTTGGACT GACAGAGCAG CTGAAACTGC GCAGCTTGGG TTGGTTTATG
3301 ATTATACACT GTTGAACTA TCTGTTGACA GTGTGACAGT CTCAGCAGAT GGAACCCGTG
3361 CTCTGGTGGA AGCAACTCTG GAGGAGTCTG CTTGTCTATC TGATTTGGTT CATCCAGAAA
3421 ACAATGCTAC TGATGTCAGA ACCTACACAA CAAGATACGA AGTTTTCTGG TCCAAGTCAG
3481 GGTGGA AAAT CACTGAAGGC TCTGTTCTTG CATCATAATA TACTCATATG TAGCATGTCT
3541 GAGCTTGCGA GATTCTCTTT GTTCTGTAAA TTCTCTCTCT AAGTTAGTGT TTATAAATGA
3601 ACACAAAAAA ATTAACGTTT TTGGCACACC CTTTTCCTTG ATCTAAACTA TAACATAAGG
3661 GCTACAA

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FIG. 1 continued 4/6

C. predicted cDNA sequence of mutated AtFtn2 gene (SEQ ID NO:9)
synonym: At5g42480; synonym: *ARC6*

Sequence length = 2406 nt

Start codon (ATG) is at position 1-3

Premature stop codon (TGA) is at position 973-975

Stop codon (TAA) is at position 2404-2406

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1   ATGGAAGCTC TGAGTCACGT CGGCATTGGT CTCTCCCCAT TCCAATTATG CCGATTACCA
61  CCGGCGACGA CAAAGCTCCG ACGTAGCCAC AACACCTCTA CAACTATCTG CTCCGCCAGC
121 AAATGGGCCG ACCGTCTTCT CTCGACTTCT AATTTACACT CCGATTCCCTC CTCCTCCTCC
181 TTCGCCACCG CCACCACCAC CGCCACTCTC GTCTCTCTGC CACCATCTAT TGATCGTCCC
241 GAACGCCACG TCCCCATCCC CATTGATTTT TACCAGGTAT TAGGAGCTCA AACACATTTT
301 TTAACCGATG GAATCAGAAG AGCATTTCGA GCTAGGGTTT CGAAACCGCC GCAATTCGGT
361 TTCAGCGACG ACGCTTTAAT CAGCCGGAGA CAGATTCTTC AAGCTGCTTG CGAAACTCTG
421 TCTAATCCTC GGTCTAGAAG AGAGTACAAT GAAGGTCTTC TTGATGATGA AGAAGCTACA
481 GTCATCACTG ATGTTCTTGG GGATAAGGTT CCTGGGGCTC TCTGTGTATT GCAAGAAGGT
541 GGTGAGACTG AGATAGTTCT TCGGGTTGGT GAGGCTCTGC TTAAGGAGAG GTTGCCTAAG
601 TCGTTTAAGC AAGATGTGGT TTTAGTTATG GCGCTTGCGT TTCTCGATGT CTCGAGGGAT
661 GCTATGGCAT TGGATCCACC TGATTTTATT ACTGGTTATG AGTTTGTTGA GGAAGCTTTG
721 AAGCTTTTAC AGGAGGAAGG AGCAAGTAGC CTTGCACCGG ATTTACGTGC ACAAATTGAT
781 GAGACTTTGG AAGAGATCAC TCCGCGTTAT GTCTTGAGC TACTTGGCTT ACCGCTTGGT
841 GATGATTACG CTGCGAAAAG ACTAAATGGT TTAAGCGGTG TGCGGAATAT TTTGTGGTCT
901 GTTGGAGGAG GTGGAGCATC AGCTCTTGTT GGGGGTTTGA CCCGTGAGAA GTTTATGAAT
961 GAGGCGTTTT TATGAATGAC AGCTGCTGAG CAGGTTGATC TTTTGTAGC TACCCCAAGC
1021 AATATTCCAG CAGAGTCATT TGAAGTTTAC GAAGTTGCAC TTGCTCTTGT GGCTCAAGCT
1081 TTTATTGGTA AGAAGCCACA CCTTTTACAG GATGCTGATA AGCAATTCCA GCAACTTCAG
1141 CAGGCTAAGG TAATGGCTAT GGAGATTCCCT GCGATGTTGT ATGATACACG GAATAATTGG
1201 GAGATAGACT TCGGTCTAGA AAGGGGACTC TGTGCACTGC TTATAGGCAA AGTTGATGAA
1261 TGCCGTATGT GGTGTTGGCTT AGACAGTGAG GATTCACAAT ATAGGAATCC AGCTATTGTG
1321 GAGTTTGTTC TGGAGAATTC AAATCGTGAT GACAATGATG ATCTCCCTGG ACTATGCAAA
1381 TTGTTGGAAA CCTGGTTGGC AGGGGTTGTC TTTCTAGGT TCAGAGACAC CAAAATATAA
1441 AAATTTAAAC TCGGGGACTA CTATGATGAT CCTATGGTTT TGAGTTACTT GGAAAGAGTG
1501 GAGGTAGTTC AGGGTCTCTC TTTAGCTGCT GCTGCAGCTA TGGCAAGGAT TGGAGCCGAG
1561 CATGTGAAAG CTAGTGCTAT GCAGGCACTG CAGAAAGTTT TTCCTTCCCG CTATACAGAT
1621 AGAACTCGG CTGAACCCAA GGATGTGCAA GAGACAGTGT TTAGTGATA TCCTGTTGGT
1681 AACAAATGTA GCCGTGATGG TGAGCCTGGT GTCTTTATTG CAGAAGCTGT AAGACCCTCT
1741 GAAAACTTTG AAACATAATG TTATGCAATT CGAGCTGGGG TCTCAGAGAG TAGCGTTGAT
1801 GAAACTACTG TTGAAATGTC CGTTGCTGAT ATGTTAAAGG AGGCAAGTGT GAAGATCCTA
1861 GCTGCTGGTG TGGCAATTGG ACTGATTTCA CTGTTTCAGC AGAAGTATTT TCTTAAAAGC
1921 AGCTCATCTT TTCAACGCAA GGATATGGTT TCTTCTATGG AATCTGATGT CGCTACCATA
1981 GGGTCAGTCA GAGCTGACGA TTCAGAAGCA CTTCCAGAA TGGATGCTAG GACTGCAGAG
2041 AATATAGTAT CCAAGTGGCA GAAGATTAAG TCTCTGGCTT TTGGGCCTGA TCACCGCATA
2101 GAAATGTTAC CAGAGGTTTT GGATGGGCGA ATGCTGAAGA TTTGGACTGA CAGAGCAGCT
2161 GAACTGCGC AGCTTGGGTT GGTTTATGAT TATACACTGT TGAACTATC TGTGACAGT
2221 GTGACAGTCT CAGCAGATGG AACCCGTGCT CTGGTGGAAG CAACTCTGGA GGAGTCTGCT
2281 TGTCTATCTG ATTTGGTTCA TCCAGAAAAC AATGCTACTG ATGTCAGAAC CTACACAACA
2341 AGATACGAAG TTTTCTGGTC CAAGTCAGGG TGGAAAATCA CTGAAGGCTC TGTTCTTGCA
2401 TCATAA

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FIG. 1 continued 5/6

D. Genomic sequence of mutated AtFtn2 gene (SEQ ID NO:10)
 (synonym: At5g42480; synonym: *ARC6*)

Sequence length = 3667 nt

This sequence contains 480 nt of the 5' and 149 nt of the 3' region

Start codon (ATG) is at position 481-483

Premature stop codon (TGA) is at position 1622-1624

Stop codon (TAA) is at position 3516-3518

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1   TGTTCATGCAT TAAGGAGAAT ACAATTATAA GCAATTTGTC TTGATTTCAA CAAGATTTTG
61  CTTGGCTATA GGATTCATTG GCTCTGTTTG CTTTACATT TACATGTCAT AATAGTTTCG
121 AATTTTACAC ATTTCAAGTG GATGTTAAGA AAAGAGAGGG AATTGATGGG GTTTTGTGGG
181 TTTAAACTTTT AAAAGTAGTCA AGAATTAAGT CATTGGTTTA CTGTTGCTCT ATATGTGTAA
241 AATGAAGGCA ACTCCAACGG TTCTTAGGTG GAATAGATTA TTTAGACGAT TTAACATCAT
301 AAAGTCCGTG GCGACTGTAA CATCATAGAT TGTTTTTTAT TTTTTCAGT AGCTGGTGAT
361 GTTTTTTGAT TTAAGTTATA CTACTCAAAA TCAAAATTCC ATAAACCCTA GACGACCAAA
421 CAGTCTCTTC AATATGTAAA ACAGAACAAA GTTTTGTAG TAGCCTAAAA AGACACTCCC
481 ATGGAAGCTC TGAGTCACGT CGGCATTGGT CTCTCCCAT TCCAATTATG CCGATTACCA
541 CCGGCGACGA CAAAGCTCCG ACGTAGCCAC AACACCTCTA CAACTATCTG CTCCGCCAGC
601 AAATGGGCCG ACCGTCTTCT CTCCGACTTC AATTTACCT CCGATTCTCT CTCCTCCTCC
661 TFCGCCACCG CCACCACCAC CGCCACTCTC GTCTCTCTGC CACCATCTAT TGATCGTCCC
721 GAACGCCACG TCCCCATCCC CATTGATTTT TACCAGGTAT TAGGAGCTCA AACACATTTT
781 TTAACCGATG GAATCAGAAG AGCATTTCGA GCTAGGGTTT CGAAACCGCC GCAATTCGGT
841 TTCAGCGACG ACGCTTTAAT CAGCCGGAGA CAGATTCTTC AAGCTGCTTG CGAAACTCTG
901 TCTAATCCTC GGTCTAGAAG AGAGTACAAT GAAGGTCTTC TTGATGATGA AGAAGCTACA
961 GTCATCACTG ATGTTTCCTG GGATAAGGTA ATTTGATTTT CGGAATAATA AAGTTTCTTC
1021 GTTTTAATTT CATGAATTGG ATAAAGGAAG GAACTTTTAT CTAGTGAAGG TTCCTGGGGC
1081 TCTCTGTGTA TTGCAAGAAG GTGGTGAGAC TGAGATAGTT CTTGCGGTTG GTGAGGCTCT
1141 GCTTAAGGAG AGGTTGCCTA AGTCGTTTAA GCAAGATGTG GTTTTAGTTA TGGCGCTTGC
1201 GTTTCTCGAT GTCTCGAGGG ATGCTATGGC ATTGGATCCA CCTGATTTTA TTACTGGTTA
1261 TGAGTTTGTT GAGGAAGCTT TGAAGCTTTT ACAGGTAGTT TGACTTGCTT TGACTGTTT
1321 ACGAGCGTTG GCTTTATAAG AACTTTCTTG ATTTGATACT TTGTTATTGA GTCTTGTTGA
1381 GGAGGAAGGA GCAAGTAGCC TTGCACCGGA TTTACGTGCA CAAATTGATG AGACTTTGGA
1441 AGAGATCACT CCGCGTTATG TCTTGAGACT ACTTGGCTTA CCGCTTGGTG ATGATTACGC
1501 TGCGAAAAGA CTAAATGGTT TAAGCGGTGT GCGGAATATT TTGTGGTCTG TTGGAGGAGG
1561 TGGAGCATCA GCTCTTGTTG GGGGTTTGAC CCGTGAGAAG TTTATGAATG AGGCGTTTTT
1621 ATGAATGACA GCTGCTGAGC AGGTATACAG TTTAGATACC TTTTTTTAAT TTCTTTAGCA
1681 TGATATAACT TTAGGTTTCT CATTTTAATG TATGTTGTGT GGTAGGTTGA TCTTTTGTGA
1741 GCTACCCCAA GCAATATTCC AGCAGAGTCA TTTGAAGTTT ACGAAGTTGC ACTTGCTCTT
1801 GTGGCTCAAG CTTTTATTGG TAAGAAGCCA CACCTTTTAC AGGATGCTGA TAAGCAATTC
1861 CAGCAACTTC AGCAGGCTAA GGTAATGGCT ATGGAGATTC CTGCGATGTT GTATGATACA
1921 CGGAATAATT GGGAGATAGA CTTGCGTCTA GAAAGGGGAC TCTGTGCACT GCTTATAGGC
1981 AAAGTTGATG AATGCCGTAT GTGGTTGGGC TTAGACAGTG AGGATTCACA ATATAGGAAT
2041 CCAGCTATTG TGGAGTTTGT TTTGGAGAAT TCAAATCGTG ATGACAATGA TGATCTCCCT
2101 GGACTATGCA AATTGTTGGA AACCTGGTTG GCAGGGGTTG TCTTTCCTAG GTTCAGAGAC
2161 ACCAAAGATA AAAAATTTAA ACTCGGGGAC TACTATGATG ATCCTATGGT TTTGAGTTAC
2221 TTGGAAGAG TGGAGGTAGT TCAGGGTTCT CTTTAGCTG CTGCTGCAGC TATGGCAAGG
2281 ATTGGAGCCG AGCATGTGAA AGCTAGTGCT ATGCAGGCAC TGCAGAAAGT TTTTCCTTCC
2341 CGCTATACAG ATAGAACTC GGCTGAACCC AAGGATGTGC AAGAGACAGT GTTTAGCTA
2401 GATCCTGTTG GTAACAATGT AGGCCGTGAT GGTGAGCCTG GTGTCTTTAT TGCAGAAGCT
2461 GTAAGACCTT CTGAAAACCT TGAACTAAT GATTATGCAA TTCGAGCTGG GGTCTCAGAG
2521 AGTAGCGTTG ATGAACTAC TGTTGAAATG TCCGTTGCTG ATATGTTAAA GGAGGCAAGT
  
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FIG. 1 continued 6/6

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2581 GTGAAGATCC TAGCTGCTGG TGTGGCAATT GGA CTGATTT CACTGTTCAG CCAGAAGTAT
2641 TTTCTTAAAA GCAGCTCATC TTTTCAACGC AAGGATATGG TTTCTTCTAT GGAATCTGAT
2701 GTCGCTACCA TAGGTATGAT TAAATGATGC AATTTTCATA TATCTGCATT GCTCAAAATA
2761 TGCTTGT TTT GTGAGCTAAG AACATAGTTC CCACTTAATA CATGTCCCAA AAGTTGTACC
2821 AAGATTAACA AGTTGCTGAG TAAATTTTAC TAATTATGCT GCTTGAATTT TTTGATCAAA
2881 CTGTAGACAG AAATGTAAAT TTCAC TCTCA ACATTTCTGT TTAGAATAAC GTAGGATTAG
2941 AGATTGCCTT AGTGTGGCTT TGTCCAACTT TTCTTTTCTT GATTTTTTTT TTTTCGATTT
3001 AGGGTCAGTC AGAGCTGACG ATTCAGAAGC ACTTCCCAGA ATGGATGCTA GGA CTGCAGA
3061 GAATATAGTA TCCAAGTGGC AGAAGATTAA GTCTCTGGCT TTTGGGCCTG ATCACC GCAT
3121 AGAAATGTTA CCAGAGGTGA GGAATAAAT CTACAATTCA ATCAATTGTG TGAAA ACTGT
3181 TGGACATGAT TATAGTCTGG TGCCTTGTTT GATTCTGTTA TTTATAGGTT TTGGATGGGC
3241 GAATGCTGAA GATTTGGA CT GACAGAGCAG CTGAAACTGC GCAGCTTGGG TTGGTTTATG
3301 ATTATACACT GTTGAAACTA TCTGTTGACA GTGTGACAGT CTCAGCAGAT GGAACCCGTG
3361 CTCTGGTGGA AGCAACTCTG GAGGAGTCTG CTTGTCTATC TGATTTGGTT CATCCAGAAA
3421 ACAATGCTAC TGATGTCAGA ACCTACACAA CAAGATACGA AGTTTCTGG TCCAAGTCAG
3481 GGTGGAAAAT CACTGAAGGC TCTGTTCTTG CATCATAATA TACTCATATG TAGCATGTCT
3541 GAGCTTGCGA GATTCTCTTT GTTCTGTAAA TTCTCTCTCT AAGTTAGTGT TTATAAATGA
3601 ACACAAAAAA ATTAACGTTC TTGGCACACC CTTTTCCTTG ATCTAAACTA TAACATAAGG
3661 GCTACAA

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FIG. 2

Amino Acid Sequences

A. predicted amino acid sequence of AtFtn2
(synonym: At5g42480; synonym: *ARC6*) protein

Sequence length = 801 aa

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1  MEALSHVGIG LSPFQLCRLP PATTKLRRSH NTSTTICSAS KWADRLLSDF NFTSDSSSSS
61  FATATTTATL VSLPPSIDRP ERHVPIPIDF YQVLGAQTHF LTDGIRRAFE ARVSKPPQFG
121 FSDDALISRR QILQAACETL SNPRSRREYN EGLLDDEEAT VITDVPWDKV PGALCVLQEG
181 GETEIVLRVG EALLKERLPK SFKQDVVLVM ALAFLDVSRD AMALDPPDFI TGYEFVEEAL
241 KLLQEEGASS LAPDLRAQID ETLEEITPRY VLELLGLPLG DDYAAKRLNG LSGVRNILWS
301 VGGGGASALV GGLTREKFMN EAFLRMTAAE QVDLFVATPS NIPAESFEVY EVALALVAQA
361 FIGKKPHLLQ DADKQFQQLQ QAKVMAMEIP AMLYDTRNNW EIDFGLERGL CALLIGKVDE
421 CRMWLGLDSE DSQYRNPAIV EFVLENSNRD DNDDLPLGLCK LLETWLAGVV FPRFRDTKDK
481 KFKLGDYYDD PMVLSYLERV EVVQGSPLAA AATMARIGAE HVKASAMQAL QKVFPSTRYT
541 RNSAEPKDVQ ETVFSVDPVG NNVGRDGEPG VFIAEAVRPS ENFETNDYAI RAGVSESSVD
601 ETTVEMSVAD MLKEASVKIL AAGVAIGLIS LFSQKYFLKS SSSFQRKDMV SSMESDVATI
661 GSVRADDSEA LPRMDARTAE NIVSKWQKIK SLAFGPDHRI EMLPEVLDGR MLKIWTDRAA
721 ETAQLGLVYD YTLLKLSVDS VTVSADGTRA LVEATLEESA CLSDLVHPEN NATDVRTYTT
781 RYEVFWSKSG WKITEGSVLA S*
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B. predicted amino acid sequence of mutated AtFtn2
(synonym: At5g42480; synonym: *ARC6*) protein

Sequence length = 324 aa

The mutated protein is truncated as a result of arc6 mutation
(premature stop)

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1  MEALSHVGIG LSPFQLCRLP PATTKLRRSH NTSTTICSAS KWADRLLSDF NFTSDSSSSS
61  FATATTTATL VSLPPSIDRP ERHVPIPIDF YQVLGAQTHF LTDGIRRAFE ARVSKPPQFG
121 FSDDALISRR QILQAACETL SNPRSRREYN EGLLDDEEAT VITDVPWDKV PGALCVLQEG
181 GETEIVLRVG EALLKERLPK SFKQDVVLVM ALAFLDVSRD AMALDPPDFI TGYEFVEEAL
241 KLLQEEGASS LAPDLRAQID ETLEEITPRY VLELLGLPLG DDYAAKRLNG LSGVRNILWS
301 VGGGGASALV GGLTREKFMN EAFL*
```

FIG. 3

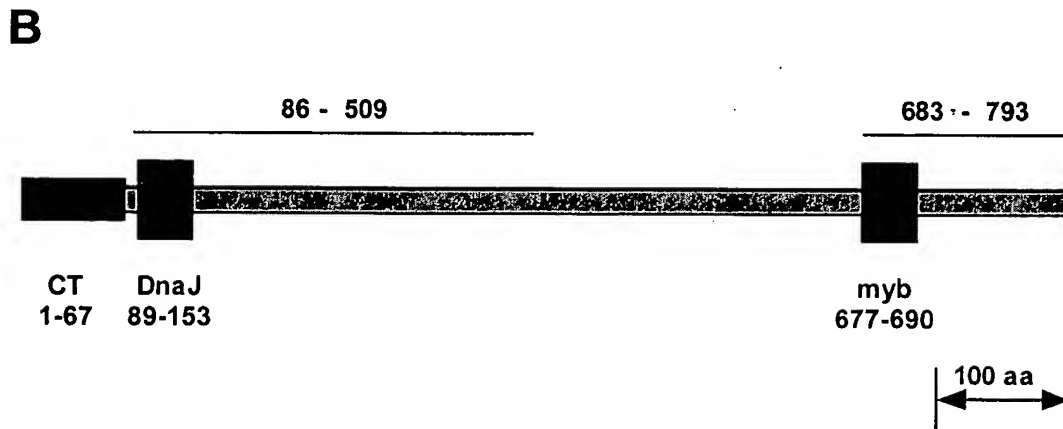
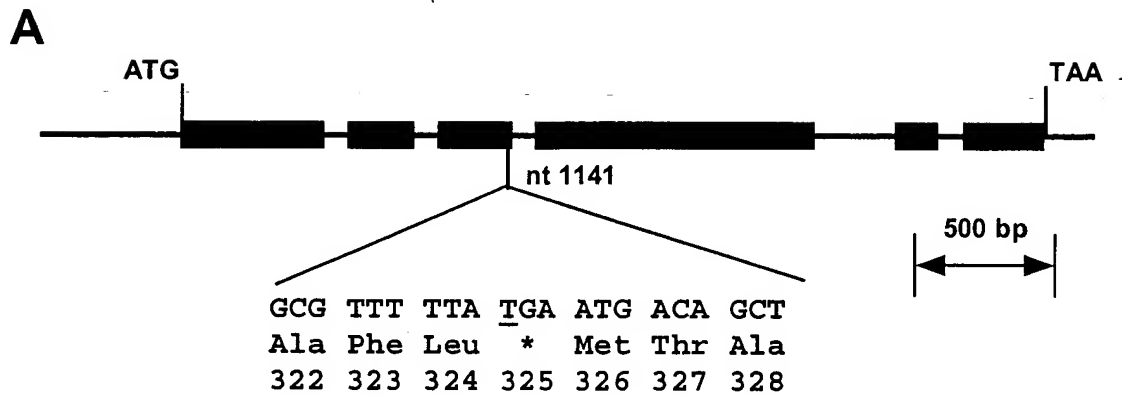


FIG. 4

Q9SAG8/55-115	DPKTLGURPD---SSEYE---VCAARQAKKHPDVCRGSN---CGV---QFQNEAVDVLKQ-IAQOME---
P93499/67-134	SLYDILGHPAG---SSQOE---IAAYRMRVRCHPDVAID---RKNSADE---FKMHAAYTISDP-DKRAVND-RSL-
O48828/68-135	SLEHLEHPVG---STSQE---ISARIRARRICHPDVARN---RDNSADD---FKMHAAYCTISDP-EKRAVND-RRT-
DNJL_MYCN/2-64	TLYDEHPOT---FTLOE---ITAYRIRARRICHPDVARN---GADT---FKMHAAYCTISDP-EKRAVND-RRT-
DNJL_MYCGE/2-64	NLDLLEHPTT---ASIKE---ITAYRIRARRICHPDVARN---GADT---FKMHAAYCTISDP-EKRAVND-RRT-
Q9SDN0/66-133	SFYDLGVIES---VTLPE---ICAYQARKHPDVSPPD---RVEEYDTR---FKMHAAYCTISDP-EKRAVND-RRT-
Q9VXT2/31-99	NCYDVLGVIRE---SKSKE---ICAYQARKHPDVSPPD---RVEEYDTR---FKMHAAYCTISDP-EKRAVND-RRT-
Q17433/36-105	NCYDVLGVIRE---FDKQK---ICAYQARKHPDVSPPD---RVEEYDTR---FKMHAAYCTISDP-EKRAVND-RRT-
Q9SH08/76-147	SPYDLEMDRN---AEEEQ---ICAYQARKHPDVSPPD---RVEEYDTR---FKMHAAYCTISDP-EKRAVND-RRT-
O94657/6-73	KLYDLEHVFHE---ASAE---ICAYQARKHPDVSPPD---RVEEYDTR---FKMHAAYCTISDP-EKRAVND-RRT-
*maize	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*rice/97-162	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*potato/109-174	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*Mtrunc/	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*Athal/89-154	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*Pm_MED4/6-71	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*Pm_MIT9313/11-76	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*Sec_WH8102/6-71	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*Syn_PCC6803/6-71	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*Nostoc/6-71	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
*Anabena/16-81	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
Q9U6V7/17-82	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
Q9TPV3/17-82	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
Q9R022/14-79	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
Q9VN28/708-772	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
O97211/9-72	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
O13601/12-78	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
O94566/12-78	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS
Q9UUG3/2-69	DFYKILGAEP---HFLGD---GIRAEAR-IAKPPQYGY-S-TEALVGRQ---MIOIADITLNO-NSRTQYD-RALS

FIG. 5

Anabena	6	QGVAVRIPIDYRIRHIGLPLAASDEQRORASDRHVLPRREYSQAALASRKOATHEEYVVLSPKERSSSVQLYLAAHAYDDP-NAAATTKVAVENRGDSN
Nostoc	1	-----VRIPIDYRIRHIGLPLAASDEQRORASDRHVLPRREYSQAALASRKOATHEEYVVLSPKERSSSVQLYLAAHAYDDP-NLAAAAVAQENRTEST
Pm_MED4	1	-----MELPDRHRRHIGVSPSATSSEILRAHQLRDKTDPGEITVEVTCORSEARLTALLTTPDSRDYENLLN-G-----AS
Pm_MT9313	1	MAAQIMDIPIDYRIRHIGLPLAASDEQRORASDRHVLPRREYSQAALASRKOATHEEYVVLSPKERSSSVQLYLAAHAYDDP-NAAATTKVAVENRGDSN
Syn_PCC6803	1	-----MFLPDRHRRHIGVSPSATSSEILRAHQLRDKTDPGEITVEVTCORSEARLTALLTTPDSRDYENLLN-G-----AS
Secc_PCC7002	1	-----MFLPDRHRRHIGVSPSATSSEILRAHQLRDKTDPGEITVEVTCORSEARLTALLTTPDSRDYENLLN-G-----AS
Secc_WH8102	5	-----MFLPDRHRRHIGVSPSATSSEILRAHQLRDKTDPGEITVEVTCORSEARLTALLTTPDSRDYENLLN-G-----AS
rice	87	-----MFLPDRHRRHIGVSPSATSSEILRAHQLRDKTDPGEITVEVTCORSEARLTALLTTPDSRDYENLLN-G-----AS
Athal	79	-----MFLPDRHRRHIGVSPSATSSEILRAHQLRDKTDPGEITVEVTCORSEARLTALLTTPDSRDYENLLN-G-----AS
potato	99	-----MFLPDRHRRHIGVSPSATSSEILRAHQLRDKTDPGEITVEVTCORSEARLTALLTTPDSRDYENLLN-G-----AS
Anabena	105	NGHFDVQSLSIEVSSSEELIG-ALITLOELGEYELVILKGRNYLGNQNGTASTRNGNHRTPPEEFLDSSSRPOTITVALSILGRQWQ--QGHMENAAL
Nostoc	95	-----KRGSDTQSLIGVITODELVG-ALITLOELGEYELVILKGRPYLVNKNSSATSSRKNLNLADEEIIYESAEHPDVMTVALACLEGREQWQ--QGHMENAAL
Pm_MED4	75	-----GLDITSSNREVA-GILITLWSSGSSKEAFKITRKALOPQTPALG-----SSREADETLAALTSRMAIQEQD--QRSISNAAD
Pm_MT9313	84	GE-----TAGLDVSPSREVA-GILITLWSSGSSKEAFKITRKALOPQTPALG-----SSREADETLAALTSRMAIQEQD--QRSISNAAD
Syn_PCC6803	79	GEALPLTTPLELCSPEQEIG-ALITLOELGEYELVILKGRPYLVNKNSSATSSRKNLNLADEEIIYESAEHPDVMTVALACLEGREQWQ--QGHMENAAL
Secc_PCC7002	97	ELEALTAHQPTIDIAEKDLGGGILITLOELGEYELVILKGRPYLVNKNSSATSSRKNLNLADEEIIYESAEHPDVMTVALACLEGREQWQ--QGHMENAAL
Secc_WH8102	88	NE-----TVGLDITAAASSEVA-GILITLWSSGSSKEAFKITRKALOPQTPALG-----SSREADETLAALTSRMAIQEQD--QRSISNAAD
rice	165	-----EALTMDEAWDKKEAGEALAVITLITLOELGEYELVILKGRPYLVNKNSSATSSRKNLNLADEEIIYESAEHPDVMTVALACLEGREQWQ--QGHMENAAL
Athal	157	-----EATVITDMPWDKVPK-ALITLOELGEYELVILKGRPYLVNKNSSATSSRKNLNLADEEIIYESAEHPDVMTVALACLEGREQWQ--QGHMENAAL
potato	177	-----FDTILTPTMPWDKVPK-ALITLOELGEYELVILKGRPYLVNKNSSATSSRKNLNLADEEIIYESAEHPDVMTVALACLEGREQWQ--QGHMENAAL
Anabena	202	SLETGQEMFSEGI-----FSSVQAMQADYKIRRYRILEJLALPQ--EKTAERSQGLIQLQSTDDRCIDG--TGNDQSGNIDDFLRFIQGLRHHIT
Nostoc	192	SLETGQEMFSEGI-----FSSVQAMQADYKIRRYRILEJLALPQ--EKTAERSQGLIQLQSTDDRCIDG--TGNDQSGNIDDFLRFIQGLRHHIT
Pm_MED4	151	FLQEGIGLQORMGK-----LGEELKTHEDVSTILPYRILDLISDL--NDYDSHKKGLSNEMENAIKRGLEG-KNKSEYNDFTNQEFESFFQGIKRPET
Pm_MT9313	163	LLHDGIGLQORMGK-----LGEELKTHEDVSTILPYRILDLISDL--NDYDSHKKGLSNEMENAIKRGLEG-KNKSEYNDFTNQEFESFFQGIKRPET
Syn_PCC6803	161	ASKALALQDND-----FPALEAEIRQYRIRRYRILEJLALPQ--EKTAERSQGLIQLQSTDDRCIDG--TGNDQSGNIDDFLRFIQGLRHHIT
Secc_PCC7002	188	SGQKSQETLQVDAQ-----FADLOQEMQDNRIRRYRILEJLALPQ--EKTAERSQGLIQLQSTDDRCIDG--TGNDQSGNIDDFLRFIQGLRHHIT
Secc_WH8102	167	LLRDGIGLQORMGK-----LDDQQAQEQEDDILPYRILDLISDL--SDADARQCGISLDDQVARDRCGLDPEGLDSETPAANGQADPESFFQGIKRPET
rice	234	VLERALKLQEDGASNLAPDLISQDDETEEYRPRVILEMISLPIDTEHKKKEGEGLOGARINIMWSVGRGGI-----ATVGGGFSEAFMNAFLRMT
Athal	235	FVEALAKLQEDGASNLAPDLISQDDETEEYRPRVILEMISLPIDTEHKKKEGEGLOGARINIMWSVGRGGI-----ATVGGGFSEAFMNAFLRMT
potato	197	-----FVEALAKLQEDGASNLAPDLISQDDETEEYRPRVILEMISLPIDTEHKKKEGEGLOGARINIMWSVGRGGI-----ATVGGGFSEAFMNAFLRMT

11

[illegible]

12

[illegible]

FIG. 6

Synechococcus sp. PCC 7942 cell division protein Ftn2 gene

A. Ftn2 DNA nucleic acid sequence (SEQ ID NO:4)

```
1 cttgccgact aaaggctaag catgccatt ccttagatta aagcagtctg tcggcggcgc
61 tgtgccggtt aacaccagtc tgtcgtgac agcgggtgcct ttctggggct tgcctgtggg
121 gcgagtaacc gatcgtggg ataagattg gtgcttctgg ctctcaagaa tagggtttc
181 cgtcgcgtat tcccgatcac atccccctgt gtctgctacg gagataacgc cgatcactca
241 acagaattgg taagttgacg gtcaagttgg gatgatgaag tcggctcaag ctggcgatcc
301 ggatctgggt ggtgttctgt gcgtattcct ctcgattact accgaattct ctgtgttggc
361 gtgcaagcct cggcagacaa acttgccgaa agctaccgag atcgctcaa ccaatcgccc
421 tcccatgagt ttacagagct ggcattgcag gcgcggcggc aactcctga agcagcgatt
481 gctgagctga gtatcccgga acagcgcgat cgctacgac gccgctttt tcagggcggt
541 ctggaagcga tgaaccaag cctagaactc gaagactggc agcgaattgg agccctgctg
601 atcctgctgg aattggggga atacgatcgc gtttcgcaac tggtgagga actcctgcca
661 gactacgacg cgagcgcaga agtacgcgat cagttcgcgc ggggtgatat cgccttggcg
721 atcgactat cccagcaatc cctcggtcga gaatgccgc agcagggctc gtacgaacag
781 gccgccagc actttggccg cagccagtct gccctagccg atcatcagcg ctttctgaa
841 ctgagtcgaa ccttcacca agaacaagga cagctacggc cctatcgcat ttggagcgg
901 ttggcccagc cttgactgc cgatagcgat cgccagcagg gtttctgtt gttgcaggcg
961 atgttgacg accggcaggg cattgaaggc cctggggatg atggctcggg gctgaccctt
1021 gataactttt tgatgtttct ccagcaaatt cgcggtatc tgaccctggc tgaacagcag
1081 ttgtgtttg aatcggaagc gcgtcggccc tcgccggctg cgagctttt tgcctgctac
1141 accctgattg cgcggggctt ttgcgatcac caacctcgt tgatccatg cgccagcttg
1201 ctcttgcatt aactcaagag ccgatggat gtgcacatg aacaggcgat cgccagccta
1261 ttgtcggac agcccgaaga agctgaggcg ctactctcc agagccaaga tgaggaaac
1321 ctacgcaaaa tccgtgccct agccaaggg gaagccctga tcgtcggttt gtgccgattc
1381 acggaaacct ggctagcgac caaggtattt ccggatttc gcgacctca ggaaggact
1441 gcgccgctgc agccctactt tgacgacccc gatgtccaga cctatctgga tgcgatcgtg
1501 gaggttgccg ccgatttgat gccaacgcg ctaccgttg agccgcttga ggtgcgatg
1561 tcgttgctgg ccaaggaact gccgaccca gcaacgcctg gtgtagctc acccctcgc
1621 cgccgtgcc gcgatcctc cgaacgtct gctcgacgg ccaaagctt gcccttgccc
1681 tggattggtt tgggggttgt ggtggtctc ggcgggtgaa caggggtttg ggcttggcga
1741 tcgcgttcca attccacccc gccgacccc ccccccgtgg ttcaaagct gcctgaggcg
```

FIG. 6 continued (2/2)

1801 gtacctgccc ctctgcccgc gccagttacc gttgccctcg atcgggctca ggctgaaact
1861 gtgttgcaaa actggttggc cgctaaagct gcagccttgg ggcctcaata cgatcgcgat
1921 cgcttagcga cgggtgctgac cggtgaggtt ctgcagactt ggcagggttt ttctagccag
1981 caggccaaca cccagctcac atcacagttc gatcacaagt taaccgtcga ctacagttcag
2041 ctacgtgacg gtgatcaacg agcagtagtc caagccaagg tcgatgaagt tgagcaggtc
2101 tatcgaggcg accagctgct cgaaacgcgc cgagatttgg gcttggtgat ccgctaccag
2161 ctctgtgcgcg agaacaacat ctggaaaatt gcttcgatta gtttggtgcg ctagggaattc
2221 gcaaggggtg aaccccctgc ggtcttttct gtagatcccc tagagcgatc gcagaatgtt
2281 cagcgattcc tggatgtgcg ctggggcatt caagagtga tcaaaaatgt ggcgacacct
2341 gccctctttg tcgatcacat aagtgcgcgc acccggaatc acaaacaggg ttttgggcac
2401 gccatagggt tgacggaggc gatcgctgc atcgctcagc agttggaagg gcaagttgta
2461 ttctgggc

B. Ftn2 Protein amino acid sequence (SEQ ID NO:5)

translation="MRIPLDYRILCVGVQASADKLAESYRDRLNQSPSHEFSELALQ
ARRQLLEAAIAELSDPEQRDRYDRRFFQGGLEAIEPSLELEDWQRIGALLILLELGEY
DRVSQLAEE LLPDYDASAEVRDQFARGDIALAIALSQQSLGRECRQQGLYEQA AQHFG
RSQSALADHQRFP ELSRTLHQEQQLRPYRILERLAQPLTADSDRQQGLLLLQAMLDD
RQGIEGPGDDGSGLTLDNFLMFLQQIRGYLT LAEQQLFESEARRPSPAASFFACYTL
IARGFCDHQPSLIHRASLLLHELKSRMDVHIEQAIASLLLGP EEEAEALLVQSQDEET
LSQIRALA QGEALIVGLCRFTETWLATKVFPDFRDLKERTAPLQPYFDDPDVQTYLDA
IVELPSDLMPTPLPVEPLEVRSSLLAKELPTPATPGVAPPPRRRRRRDRSERPARTAKR
LPLPWIGLGVVVVLGGGTGVWAWRSRSNSTPPTPPPVVQTLPEAVPAPSPAPVTVALD
RAQAETVLQNWLA AKAALGPQYDRDRLATVLTGEVLQ TWQGFSSQQANTQLTSQFD
HKLTVDSVQLSDGDQRAVVQAKVDEVEQVYRGDQLLETRRDLGLVIRYQLVRENNIW
KIASISLVR"

FIG. 7

Synechococcus sp. PCC 7942 cell division protein Ftn6 gene

A. Ftn6 DNA nucleic acid sequence (SEQ ID NO:6)

```
1 ctcgatactt gggagttgaa cacagagtag tagtctaagt aacaactgct cgtgagcaat
61 ttgtactact tttacaaa tttgagctc agttttcgcg aaaactggga tgtgagttg
121 aaccctcagc agcaaaattg taccgctga gacttttacc gttttattcg gccatctggg
181 aacaatgcc ctggagctta ttgtgacctc taccgctact gccgttattg ccttgtaga
241 acgtatttgc gagctgtcgg cagcgcgagc agcagaggtc ttgcagcaac tgcgatcgca
301 ccacctgaa gcctggattt atcccgccac agtcgaggcg atttaccag gccgttaccg
361 ctgggtgtcg atgcacaaa tccttgctct gtggcagcgg cgcgggcaga tcaactgcca
421 ctcagtgcga gactatgagc gcttgttgcg cggatgaagt ccagagcaac ccgatcgcat
481 caatgttgag acgcggctcc ctgcgatcgc catgacctg ccttgggtgc cagaacagcc
541 tggagaagca ttcgtgccag cgcaagatca gtcgggttta actgagcgcc ttataaaac
601 gttggtcaaa gcgggcagcg attgcgctgg gtaggcttag aacagttgcc atccaaactt
661 gagagtgcgc gttcggccag ccaagagaat tccaagagcc ttcagaacg gacaacaatt
721 ctgctctaca atcaagcccg agtgaagagg cggcgggcta ttgctgaat ggcaaaaaac
781 atcattcttt cagcaatcgt ggggtatacc tacgacaaaa ttgacctatt cttactctt
841 gcactccgta acacctcagc agatattctt ttaattgcat caagtccttc agcccaactc
901 cgtcatcagt tattgagttc acctcgggtc aaactcgttg atgtgaacct tcaaggtgaa
961 ccagctgaaa tggatattcg ccgtttcttt attgccaagg agattttggc gagaatcgaa
1021 gcagatgaaa ttctcttgag cgatgctcgc gatgtctatt tccaatctga cccttttgg
1081 gtccaagggg ttttatttgc cgaggaacct cagctaactc caaactgtaa agtcaatagc
1141 agctggataa aaaaataactt aggagaggat gagtttcaag ccatttctcc taatccaatt
1201 ctctgcgggg gcaaccatgt gctggatgcc accaaggcct ttagcctgac gttgaccaca
1261 ccagaagaaa ttgtgggct gcccgagagt ttgctggcct tggcggctca agctgctcaa
1321 gccgctggtg aaacagaggc aacacccgaa gccggccctt ggcgaatcac cctcgacttc
1381 ccaagctttg
```

B. Ftn6 Protein amino acid sequence (SEQ ID NO:7)

```
MGTIALELIVTSTRTAVIALLEYFELSAARAAEVLQQLRSHHP
EAWIYPATVEAIYQGRYRWVSIAQILALWQRRGQINCHFSADYERLLLGEVPEQP
DRINVETRLPAIAMTLPWVPEQPGFAFVPAQDQSGLTERLYKTLVKAGSDCAG
```

"Replacement Sheet"

FIG. 8

Additional Sequences

First Set

ACCESSION BK000999

SEQ ID NO:125:

MEGFHNLLARPNSAPFAFSLPRPRPRRRRPPPHPSAACRAASR
WAERLFADFHLLPTAAPSDPPSPAPAPAAAPSASPFVPLFPDAAERSLPLQVDFYKVL
GAEPHFLGDGIRRAFEARIAKPPQYGYSTDALVGRRQMLQIAHDTLMNQNSRTQYDRA
LSENREEALTMDIAWDKEAGEALAVLVTGEQLLLDRPPKRFKQDVVLAMALAYVDLSR
DAMAASPPDVIGCCEVLERALKLLQEDGASNLPDLLSQIDETLEEITPRCVLELLSL
PIDTEHHKKRQEGLOQARNILWSVGRGGIATVGGGFSREAFMNEAFLRMTSIEQMDF
SKTPNSIPPEWFEIYNVALAHVAQAIISKRPQFIMMADDLFEQLQKFNIGSHYAYDNE
MDLALERAFCSLLVGDVSKCRMWLGIDNESSPYRDPKILEFIVTNSSISEENDLLPGL
CKLLETWLIFEVFPSSRDTRGMQFRLGDYDDPEVLSYLERMEGGGASHLAAAAIAK
LGAQATAALGTVKSNAIQAFNKVFPLIEQLDRSAMENTKDGPGGYLENFDQENAPAH
SRNAALKIISAGALFALLAVIGAKYLPRKRPLSAIRSEHGSAVANSVDSTDDPALDE
DPVHIPRMDAKLAEDIVRKWQSIKSKALGPEHSVASLQEVLDGNMLKVWTDRAAEIER
HGWFWEYTLSDVTIDSITISLDGRRATVEATIDEAGQLTDVTEPRNNDSDTKYTTRY
EMAFSKLGGWKITEGAVLKS"

SEQ ID NO:126:

BASE COUNT 551 a 576 c 592 g 564 t

ORIGIN

1	atggaggggct	tccacaacct	cctcgcccg	cccaactcgg	cgccattcgc	cttctccctc
61	cctcgcccg	gcccgcgccc	gcgcgcgagg	ccgcccgcctc	acccctccgc	tgccctgccgc
121	gccgcgagcc	gctggggccga	acgcctcttc	gccgacttcc	acctcctccc	caccgcgcgcg
181	ccctccgacc	cgccgtcccc	ggccccggcc	ccggccgcgcg	cgccctccgc	ctcccccttc
241	gtcccgcctct	tccccgacgc	cgccgaacgc	tccctcccgc	tccaagtcga	tttctacaag
301	gttctagggg	cagagccaca	tttccttggc	gatggcatca	ggagggcggt	cgaggcacgcg
361	atagccaagc	caccgcagta	tggtacagc	acggatgctc	ttgttggtcg	tcgacaaatg
421	ctgcagattg	cccatgacac	tctcatgaac	cagaactccc	gcactcagta	tgatcggtgcg
481	ctttctgaga	accgtgaaga	agctctcacc	atggatattg	cttgggacaa	ggaggctggg

"Replacement Sheet"

FIG. 8 continued 2/40

541 gaggcacttg ctgtgcttgt aactggagaa cagttgcttc tggatcggcc acccaagcgc
601 ttcaagcagg acgtggtgct agcgatggct ctggcttatg tggatctatc aagggatgct
661 atggcagcaa gccctccaga tgtaattggc tgctgcgagg tgctcgagag ggctctcaag
721 ctcttgcaagg aagatggagc aagcaatctc gcacctgacg tgctttcaca gattgatgaa
781 actctcgagg agattacacc tcgctgtgta ttggagcttc tctcccttcc tattgacaca
841 gagcatcata agaagcgcca agaagggtt caaggtgcga gaaacatttt gtggagcgtt
901 ggcagaggag gtattgctac cggttgagga ggattttctc gtgaagcctt catgaacgag
961 gcttttttga ggatgacatc aattgaacag atggatttct tttcaaaaac accgaatagc
1021 attcctcctg aatggtttga aatttacaat gtagcacttg cacatgtcgc tcaagcaatt
1081 ataagtaaaa ggccacaatt catcatgatg gcggatgatc tttttgaaca actccagaag
1141 ttcaacatag gttctcatta tgcttatgat aatgagatgg accttgcaatt ggaaagggca
1201 ttctgctcat tgctagtcgg agatgttagc aagtgcagaa tgtggcttgg aattgataat
1261 gagtcttcac catacagaga ccccaaaatt ctagagttta ttgtgaccaa ctctagcatc
1321 agtgaagaga atgatcttct tccagggtctg tgcaagcttt tggagacttg gcttatcttt
1381 gaggtttttc ctaggagcag agatactcgg ggcacgcagt tcagacttgg agattactac
1441 gatgatccag aagttttaag ctacctagaa aggatggagg gtggtggtgc ttctcatttg
1501 gctgctgctg ctgctattgc aaaacttggg gctcaagcta cagctgcact tggtagctg
1561 aaatcaaatg ctattcaagc gttcaacaag gtttttccat tgatagaaca gttagacagg
1621 tcagccatgg aaaatactaa agatggccct gggggatatac ttgaaaattt tgaccaggaa
1681 aatgcacctg ctcattgattc gagaaatgcc gccttgaaga ttatctctgc tggcgactg
1741 tttgactgtg tggcagtaat tggggccaaa tatttgccctc gtaagaggcc cctttctgct
1801 attaggagtg agcatggatc tgtggcagtt gctaatagtg tcgactctac tgatgatcct
1861 gcactagatg aagatccagt acatattcct agaattggatg cgaagctggc agaagatatt
1921 gttcgcaagt ggcagagtat caaatctaag gccttgggac cagaacattc ggttgcatca
1981 ttgcaagagg ttcttgatgg caacatgcta aagggtgtgga ctgaccgagc agcggagatt
2041 gagcgtcatg ggtggttctg ggagtataca ctatccgatg tgacgattga tagcatcact
2101 atctccctag atggtcgacg agcgactgtg gaggctacga ttgatgaggc aggccaaactt
2161 actgatgtta ctgagcccag aaacaatgat tcatatgaca caaaatacac taccgggtat
2221 gagatggcct tctccaagct aggaggggtg aagataacgg aaggagcagt cctcaagtcg
2281 tag

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FIG. 8 continued 3/40

ACCESSION BAB10489

SEQ ID NO:127:

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1 mealshvgig lspfqlcrp pattklrrsh ntstticsas kwadrllsdf nftsdsssss
61 fatatttatl vspppsidrp erhvpipidf yqvlgaqthf ltdgirrafe arvskppqfg
121 fsddalisrr qilqaacetyl snprsrreyn egllddeeat vitdvpwdkv pgalcylqeg
181 geteivlrvg eallkerlpk sfkqdvvlvm alafldvsrd amaldppdfi tgyefveeal
241 kllqeegass lapdlraqid etleeitpry vlellglplg ddyaakrlng lsgvrnilws
301 vggggasalv ggltrekfmm eaflrmatae qvdlfvatps nipaesfevy evalalvaga
361 figkkphllq dadkqfqqlq qakvmameip amlydtrnnw eidfglergl calligkvde
421 crmwlgldse dsqyrnpaiv efvlensnrd dnddlpglck lletwlagvv fprfrdtkdk
481 kfkldgydd pmvlsylerv evvqgsplaa aaamarigae hvkasamqal qkvfpsrytd
541 rnsaepkdvq etvfsvdpvg nnvgrdgepg vfiaeavrps enfetndyai ragvsessvd
601 ettvemsvad mlkeasvkil aagvaiglis lfsqkyflks sssfqrkdmv ssmesdvati
661 gsvraddsea lprmdartae nivskwqkik slafgpdhri emlpevldgr mlkiwtdraa
721 etaqlglvyd ytllklsvds vtvsadgtra lveatleesa clsdlvhpen natdvrtytt
781 ryevfwsksg wkitegsvla s
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"Replacement Sheet"

FIG. 8 continued 4/40

NM_123613.1 | (SEQ ID NO:128):

ATGGAAGCTCTGAGTCACGTCGGCATTGGTCTCTCCCCATTCCAATTATGCCGATTACCACCGGCGACGA
CAAAGCTCCGACGTAGCCACAACACCTCTACAATATCTGCTCCGCCAGCAAATGGGCCGACCGTCTTCT
CTCCGACTTCAATTTACCTCCGATTCTCTCTCTCTCTCGCCACCGCCACCACCACCGCCACTCTC
GTCTCTCCGCCACCATCTATTGATCGTCCCGAACGCCACGTCCCCATCCCCATTGATTCTACCAGGTAT
TAGGAGCTCAAACACATTTCTTAACCGATGGAATCAGAAGAGCATTCTGAAGCTAGGGTTTCGAAACCGCC
GCAATTCGGTTTCAGCGACGACGCTTTAATCAGCCGGAGACAGATTCTTCAAGCTGCTTGCGAAACTCTG
TCTAATCCTCGGTCTAGAAGAGAGTACAATGAAGGTCTTCTTGATGATGAAGAAGCTACAGTCATCACTG
ATGTTCTTGGGATAAGGTTCTGGTGTCTCTGTGTATTGCAAGAAGGTGGTGAGACTGAGATAGTTCT
TCGGGTTGGTGAGGCTCTGCTTAAGGAGAGGTTGCCTAAGTCGTTTAAGCAAGATGTGGTTTTAGTTATG
GCGCTTGCGTTTTCTCGATGTCTCGAGGGATGCTATGGCATTGGATCCACCTGATTTTATAACTGGTTATG
AGTTTGTGAGGAAGCTTTGAAGCTTTTACAGGAGGAAGGAGCAAGTAGCCTTGACCGGATTTACGTGC
ACAAATTGATGAGACTTTGGAAGAGATCACTCCGCGTTATGTCTTGAGCTACTTGGETTACCGCTTGGT
GATGATTACGCTGCGAAAAGACTAAATGGTTTAAGCGGTGTGCGGAATATTTTGTGGTCTGTTGGAGGAG
GTGGAGCATCAGCTCTTGTGGGGGTTTGACCCGTGAGAAGTTTATGAATGAGGCGTTTTTACGAATGAC
AGCTGCTGAGCAGGTTGATCTTTTGTAGCTACCCCAAGCAATATTCAGCAGAGTCATTGAAGTTTAC
GAAGTTGCACTTGCTCTTGTGGCTCAAGCTTTTATTGGTAAGAAGCCACACCTTTTACAGGATGCTGATA
AGCAATTCCAGCAACTTCAGCAGGCTAAGGTAATGGCTATGGAGATTCTGCGATGTTGTATGATACACG
GAATAATTGGGAGATAGACTTCGGTCTAGAAAGGGGACTCTGTGCACTGCTTATAGGCAAAGTTGATGAA
TGCCGTATGTGGTTGGGCTTAGACAGTGAGGATTCAATATAGGAATCCAGCTATTGTGGAGTTTGT
TGGAGAATTCAAATCGTGATGACAATGATGATCTCCCTGGACTATGCAAATTGTTGGAAACCTGGTTGGC
AGGGGTTGTCTTTCTAGGTTTCAGAGACACCAAAGATAAAAAATTTAACTCGGGGACTACTATGATGAT
CCTATGTTTTGAGTTACTTGGAAAGAGTGGAGGTAGTTTCAAGGTTCTCTTTAGCTGCTGCTGCAGCTA
TGGCAAGGATTGGAGCCGAGCATGTGAAAGCTAGTGCTATGCAGGCACTGCAGAAAGTTTTCTTCCCG
CTATACAGATAGAACTCGGCTGAACCAAGGATGTGCAAGAGACAGTGTTTAGTGTAGATCCTGTTGGT
AACAATGTAGGCCGTGATGGTGAGCCTGGTGTCTTTATTGCAGAAGCTGTAAGACCCTCTGAAAACCTTG
AACTAATGATTATGCAATTCGAGCTGGGGTCTCAGAGAGTAGCGTTGATGAACTACTGTTGAAATGTC
CGTTGCTGATATGTTAAAGGAGGCAAGTGTGAAGATCCTAGCTGCTGGTGTGGCAATTGGACTGATTTCA
CTGTTTCAGCCAGAAGTATTTCTTAAAGCAGCTCATCTTTTCAACGCAAGGATATGGTTTCTTCTATGG
AATCTGATGTGCTACCATAGGGTCAGTCAGAGCTGACGATTCTCAGAGCACTTCCAGAAATGGATGCTAG
GACTGCAGAGAATATAGTATCCAAGTGGCAGAAGATTAAAGTCTCTGGCTTTTGGGCCTGATCACCGCATA
GAAATTGTACCAAGAGTTTGGATGGGCGAATGCTGAAGATTGGACTGACAGAGCAGCTGAACTGCGC
AGCTTGGGTTGGTTTATGATTATACACTGTTGAACTATCTGTTGACAGTGTGACAGTCTCAGCAGATGG
AACCCGTGCTCTGGTGGAAAGCAACTCTGGAGGAGTCTGCTTGTCTATCTGATTGTTGTTTATCCAGAAAAC
AATGCTACTGATGTGCAACCTACACAACAAGATACGAAGTTTTCTGGTCCAAGTCAGGGTGGAAAATCA
CTGAAGGCTCTGTTCTTGATCATAA

NP_199063.1 (SEQ ID NO:129):

MEALSHVIGLSPFQLCRLPPATTKLRRSHNTSTTICSASKWADRLLSDFNFTSDSSSSSFATATTTATL
VSPPPSIDRPERHVPIPIDFYQVLGAQTHFLTDGIRRAFEARVSKPPQFGFSDDALISRRQILQAACETL
SNPRSRREYNEGLLDDEEATVITDVPWDKVPALCVLQEGGETEIVLRVGEALLKERLPKSFQDVLVLM
ALAFLDVSRDAMALDPPDFITGYEFVEEALKLLQEEGASSLAPDLRAQIDETLEEITPRYVLELLGLPLG
DDYAAKRLNGLSGVRNILWSVGGGGASALVGGLTREKFMNEAFLRMTAAEQVDL FVATPSNIPAESFEVY
EVALALVAQAFIGKKPHLLQDADKQFQQLQQAQVMAMEIPAMLYDTRNNWEIDFGLERGLCALLIGKVDE
CRMWLGLDSEDSQYRNPAIVEFVLENSNRDDNDLPLGLCKLLETWLAGVVFPRFRDTKDKKFKLGDYYDD
PMVLSYLERVEVVQGSPLAAAAAMARIGAEHVKASAMQALQKVFPSTRYTDNRNSAEPKDVQETVFSVDPVG
NNVGRDGEPGVFIAEAVRPSNFETNDYAIRAGVSESSVDETTVEMSVADMLKEASVKILAAGVAIGLIS
LFSQKYFLKSSSSFRKDMVSSMESDVATIGSVRADDSEALPRMDARTAEINIVSKWQKIKSLAFGPDHRI
EMLPEVLDGRMLKIWTDRAAETAQLGLVYDYTLCLKLSVDSVTVSADGTRALVEATLEESACLSDLVHPEN
NATDVRTYTRYEVFWSKSGWKITEGSLAS

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FIG. 8 continued 5/40

AY091075.1 (SEQ ID NO:130):

GATTTAACTTATACTACTCAAAATCAAAATTCATATAACCCCTAGACGACCAAACAGTCTCTTCAATATGT
AAAACAGAACAAAGTTTTTGTAGTAGCCTAAAAAGACACTCCCATGGAAGCTCTGAGTCACGTCGGCATT
GGTCTCTCCCCATTCCAATTATGCCGATTACCACCGGCGACGACAAAGCTCCGACGTAGCCACAACACCT
CTACAACTATCTGCTCCGCCAGCAAATGGGCCGACCGTCTTCTCTCCGACTTCAATTTACCTCCGATTCT
CTCCTCCTCCTCCTTCGCCACCGCCACCACCACCGCCACTCTCGTCTCTCCGCCACCATCTATTGATCGT
CCCGAACGCCACGTCCCATCCCATTTGATTTCTACCAGGTATTAGGAGCTCAAACACATTTCTTAACCG
AATCAGCCGGAGACAGATTCTTCAAGCTGCTTGCGAAACTCTGTCTAATCCTCGGTCTAGAAGAGAGTAC
AATGAAGGTCTTCTTGATGATGAAGAAGCTACAGTCATCACTGATGTTCTTGGGATAAGGTTCTGGTG
CTCTCTGTGTATTGCAAGAAGGTGGTGAGACTGAGATAGTTCTTCCGGTTGGTGAGGCTCTGCTTAAGGA
GAGGTTGCCTAAGTCGTTTAAAGCAAGATGTGGTTTTAGTTATGGCGCTTGCGTTTCTCGATGCTCGAGG
GATGCTATGGCATTGGATCCACCTGATTTTATAACTGGTTATGAGTTTGTTGAGGAAGCTTTGAAGCTTT
TACAGGAGGAAGGAGCAAGTAGCCTTGACCCGGATTTACGTGCACAAATTGATGAGACTTTGGAAGAGAT
CACTCCGCGTTATGTCTTGAGCTACTTGCGTTACCGCTTGGTGATGATTACGCTGCGAAAAGACTAAAT
GGTTTAAAGCGGTGTGCGGAATATTTTGTGGTCTGTTGGAGGAGGTGGAGCATCAGCTCTTGTGGGGGT
TGACCCGTGAGAAGTTTATGAATGAGGCGTTTTTACGAATGACAGCTGCTGAGCAGGTTGATCTTTTGT
AGCTACCCCAAGCAATATTCCAGCAGAGTCATTTGAAGTTTACGAAGTTGCACTTGCTCTTGTGGCTCAA
GCTTTTATTGGTAAGAAGCCACACCTTTTACAGGATGCTGATAAGCAATTCCAGCAACTTCAGCAGGCTA
AGGTAATGGCTATGGAGATTCTGCGATGTTGTATGATACACGGAATAATTGGGAGATAGACTTCGGTCT
AGAAAGGGGACTCTGTGCACTGCTTATAGGCAAAGTTGATGAATGCCGTATGTGGTTGGGCTTAGACAGT
GAGGATTACAAATATAGGAATCCAGCTATTGTGGAGTTTGTGTTTGGAGAATTCAAATCGTGATGACAATG
ATGATCTCCCTGGACTATGCAAATTGTTGGAAACCTGGTTGGCAGGGGTTGTCTTTCTAGGTTTCAGAGA
CACCAAAGATAAAAAATTTAAACTCGGGGACTACTATGATGATCCTATGGTTTTGAGTTACTTGGAAGA
GTGGAGGTAGTTTCAGGGTTCTCCTTTAGCTGCTGCTGCAGCTATGGCAAGGATTGGAGCCGAGCATGTGA
AAGCTAGTGCTATGCAGGCACTGCAGAAAGTTTTTCTTCCCGCTATACAGATAGAAACTCGGCTGAACC
CAAGGATGTGCAAGAGACAGTGTTTAGTGATAGATCCTGTTGGTAACAATGTAGGCCGTGATGGTGAGCCT
GGTGCTTTTATTGCAAGCTGTAAAGACCTCTGAAAACCTTTGAAACTAATGATTATGCAATTCGAGCTG
GGGTCTCAGAGAGTAGCGTTGATGAAACTACTGTTGAAATGTCCGTTGCTGATATGTTAAAGGAGGCAAG
TGTGAAGATCCTAGCTGCTGGTGTGGCAATTGGACTGATTTCACTGTTTCAGCCAGAAGTATTTCTTAAA
AGCAGCTCATCTTTTCAACGCAAGGATATGGTTTTCTTCTATGGAATCTGATGTCGCTACCATAGGGTCAG
TCAGAGCTGACGATTGAGAAGCACTTCCAGAAATGGATGCTAGGACTGCAGAGAATATAGTATCCAAGTG
GCAGAAGATTAAGTCTCTGGCTTTTGGGCCTGATACCGCATAGAAATGTTACCAGAGGTTTTGGATGGG
CGAATGCTGAAGATTTGGACTGACAGAGCAGCTGAAACTGCGCAGCTTGGGTTGGTTTATGATTATACAC
TGTTGAAACTATCTGTTGACAGTGTGACAGTCTCAGCAGATGGAACCCGTGCTCTGGTGGAAGCAACTCT
GGAGGAGTCTGCTTGTCTATCTGATTTGGTTCATCCAGAAAACAATGCTACTGATGTCAGAACCTACACA
ACAAGATACGAAGTTTTCTGGTCCAAGTCAGGGTGGAAAATCACTGAAGGCTCTGTTCTTGCATCATAAT
ATACTCATATGTAGCATGTCTGAGCTTGCGAGATTCTTTGTTTTGTAAATTCTCTCTAAGTTAGTG
TTTATAATGAACACAAAAAATTAACGTTCAAAAAA

"Replacement Sheet"

FIG. 8 continued 6/40

ACCESSION AAM13895 (SEQ ID NO:131):

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1 mealshvgig lspfqclrlp pattklrrsh ntstticsas kwadrllsdf nftsdsssss
61 fatatattatl vspppsidrp erhvpipidf yqvlgaqthf ltdgirrafe arvskppqfg
121 fsddalisrr qilqaacetyl snprsrreyn egllddeeat vitdvpwdkv pgalcvlqeg
181 geteivlrv eallkerlpk sfkqdvvlvm alafldvsrd amaldppdfi tgyefveeal
241 kllqeegass lapdlraqid etleeitpry vlellglplg ddyaakrlng lsgvrnilws
301 vggggasalv ggltrekfmn eaflrmtaee qvdlfvatps nipaesfevy evalalvaqa
361 figkkphllq dadkqfqqlq qakvmameip amlydtrnnw eidfglergl calligkvde
421 crmwlgldse dsqyrnpaiv efvlen snrd dnddlpglck lletwlagvv fprfrdtkdk
481 kfkldgydd pmvlsylerv evvqgsplaa aaamarigae hvkasamqal qkvfpsrytd
541 rnsaepkdvq etvfsvdpvg nnvgrdgepg vfiaeavrps enfetndyai ragvsessvd
601 ettvemsvad mlkeasvkil aagvaiglis lfsqkyflks sssfqrkdmv ssmesdvati
661 gsvraddsea lprmdartae niyskwqkik slafgpdhri emlpevldgr mlkiwtdraa
721 etaqlglvyd ytllklsvds vtvsadgtra lveatleesa clsdlvhpen natdvrtytt
781 ryevfwsksg wkitegsvla s
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"Replacement Sheet"

FIG. 8 continued 7/40

GenBank Acc: AI998415 (SEQ Id NO:132):

ATAAACACTAACTTAGAGAGAGAATTTACAAAACAAAGAGAATCTCGCAAGCTCAGACAT
GCTACATATGAGTATATTATGATGCAAGAACAGAGCCTTCAGTGATTTTCCACCCTGACT
TGGACCNGAAACTTCGTATCTTGTGTGTAGGTTCTGACATCAGTAGCATTGTTTTCTG
GATGAACCAAATCAGATAGACAAGCAGACTCCTCCAGAGTTGCTTCCACCAGAGCACGGG
TTCCATCTGCTGAGACTGTCACTGTCAACAGATAGTTTCAACAGTGTATAATCATAAA
CCAACCCAAGCTGCGCAGTTTCAGCTGCTCTGTGTCAGTCCAAATCTTCAGCATTGCCCCAT
CCAAAACCTCTGGTAACATTTCTATGCGGTGATCAGGCCCAAAGCCAGAGACTTAATCT
TCTGCCACTTGGATACTATATTCTCTGCAGTCCTAGCATCCATTCTGGGAAGTGCTTCTG
AATCGTCAGCTCTGACTGACCCTATGGTAGCGACATCAGNTTCCATAGAAGAAACCATAT
NCTTGCGTTGAAAAGATGAGC

GenBank Acc: AL382914 (SEQ ID NO:133):

CTGGTGTAGCAATTGGACTCATAACTTTAGCTGGTTTGAAGATTTTACCTTCTAAAAATG
GCTCGCCCGTTCTTCACAAAGTGACTGGTTTCAGCAATTGCGTCAGATACTATCAATTTAG
GTCCTGTAGGAGATGAAGAATTAGGAGAGCAACTACCAAAAATGAGTGCAATGGTTGCAG
AAGCTCTAGTCCGCAAGTGGCAATATATCACATCCCAAGCTTTTGGACCTGACCATTGCC
TAGGAAGATTGCAAGAGGTGTTGGACGGCCAAATGTTGAAGATATGGACTGATCG

GenBank Acc: AL382915 (SEQ ID NO:134):

CCCAAGCTTTTGGACCTGACCATTGCCTAGGAAGATTGCAAGAGGTGTTGGACGGCGAAA
TGTTGAAGATATGGACTGATCGAGCAGCTGAGATTGCAGAGCTTGGTTGGTCATATGACT
ACAACTTGGAGGATCTCAACATCGACAGTGTGACCATATCACAGAATGGGCGGCGTGCAG
TAGTGGAACAACACTCTCAAAGAGTCTACCCACCTCACTGCTGTTGGTCATCCACAGCATG
CTACTTCCAACAGCAGAACCTACACAACAAGATATGAAATGTCTTTTTCAGATTCAGGGT
GGAAAATTATTGAAGGAGCTGTCCTTGAGTCGTAATTAGGTTTTGTAATATGTAATATAT
GTCAGGTTAGTACACTTCAATATTAACCCCTCGAGCCTATGCCCCACTGTCTTGATGTA
CCTGTTGTTTTGTGCATTTTTCAAGCATTTATGTAGTCAGGCTGTAAATACTTGGAGGGT
ATTTGATCAAATAATTATCCGGTTAAAAAAAAAAAAAAAAAAAAAAAAAAAA

"Replacement Sheet"

FIG. 8 continued 8/40

GenBank Acc: BI268376 (SEQ ID NO:135):

CACGCTTCTCCAAAAACCTAACCGTCTCCATTCCCTCCGCCGTCTCCGCCACCAGTAAAT
GGGCGGAGCGACTCATTTCCGATTTCCAATTCCTCGGCGACACCTCCTCTTCCTCCTCCA
CCACCACCTCCGCCACAGTCACTCTCACTCCTTCTTACCCTCCTCCGATAGAAGCCACG
TGTCACTCCCTCTCGACCTGTACAAAATCCTCGGCGCCGAAACGCATTTTCTCGGTGATG
GTATTCCGAGAGCTTATGAAGCGAAATTCTCGAAGCCTCCTCAGTATGCTTTCAGTAATG
AAGCTTTGATTAGTCGTCGTCAGATTCTTCAAGCTGCTTGTGAAACCCTAGCTGATCCTG
CTTCTAGAAGAGAGTATAATCAAAGCCTCGTCGACGATGAAGACGAAGATGAGGAATCTT
CCATTCTCACTGAAATCCCTTTGACAAAAGTTCTGGAGCTCTGTGCGTGTTGCAAGAAG
CTGGAGAGACGGAGTTGGTGCTTCGGATTGGAGGGGGTTTACTGAGAGAGAGGTTACCGA
AGATGTTTAAGCAAGATGTTGTGTTGGCTATGGCGCTTGCATATGTTGACGTTTCTAGGG
ATGCTATGGCTTTGTCCCCGCCAGATTTTATTGTTGCTTGTGAGATGCTGGAAAGGGCAT

AW472683 (SEQ ID NO:136):

AGCGTTGTGTGTGTTGCAGGAAGCTGGAGAGACGGAGCTTGTGCTTGAGATTGGGCAGGG
TTTGCTTAGGGAGAGGTTGCCGAAGACGTTTAAGCAGGATGTTGTGTTGGCTATGGCACT
CGCATTGTGACGTGTCAAGGGATGCTTGGCTTGTTACCGGATTTTATTGCGGCTGTG
AGATGCT

BE472035 (SEQ ID NO:137):

GGAAAGCTTCCTTAACAATGGAGGCATTAACACAGCTAAGCTTTGGCATTTGTACTCCAC
GCCTTTTCATCACCATTTCACTAGCCGCCGCCGGTGGAAGAAGCCGCCGAGACTCAATG
CCGTTAACGGAGGAGCTAGTAGTGTTACCGGTGGAACAAGTAGTTTACCTACTAACTTCT
CCGCTAGTAAATGGGCGGATCGTCTTCTCGCCGATTTCCAATTCCTTCCTTCCACCACCA
CCTCCGACTCATCGGATTTCCAGAATTCAACTTCTACAACCTCCGTTACGACTATTCTCTC
CTCCTGTTGCTCCTTCAGACCACCACATTTCAATGCCTATAGACTTTTATAGAGTGCTTG
GTGCTGAAGCTCACTTCCTCGGTGACGGTATTAGGAGATGCTACGATGCTAGAATTACAA
AGCCTCCGCAGTACGGATACAGTCAGGAAGCATTGATTGGCCGACGGCAGATTCTTCAAG

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FIG. 8 continued 9/40

CTGCTTGTGAAACCCTTGCTGACTCTACCTCTCGTAGAGAGTACAATCAAGGCCTCGCTC
AGCATGAGTTTCGATACTATTCTAACTCCTGTCCCCTGGGATAAAGTTCGGGAGCAATGT
GTGTTTTG

BI120337 (SEQ ID NO:138):

GAAGATTTTCATGAATGAGGCCTTCTTACGTATGACAGCAGCTGAGCAGGTTGATCTGTTC
GTCACCACGCCAAGTAATATCCCGGCTCAAAATTTTGAAGTTTATGGAGTGGCACTTGCC
CTTGTTGCCCAAGCTTTTCATTGGTAAAAAGCCTCATCTCATCACAGATGCTGATAACCTA
TTCGGACAGCTTCAGCAGATTAAGGTAACAAATCAAGGGAGTCTTGTTCTGTCTTTGGT
TCCATGGAAAACCGTGATATTGACTTTGGGTTGGAGAGGGGCTTTGTTCACTGCTTGATG
GCCAGCT

AI043508 (SEQ ID NO:139):

GGGAAACGTGCCTTGGTGGAAGCAACTCTTCAAGAATCAGCGCAGTTAACTGACGTTAAC
CAACCTGAGCATAACGATTCTTACAGCAGAACATACACAACAAGGTACGAGATGTTTCAC
TCCAATGCTGGGTGGAAGATCATAGAGGGAGCTGTCCTCCAATCTTAAGCTGCTGGAAAT
CCAGTCTTGAATGTACATATTTTACATCATCTGCACATTATGAATGAAGGATGGTATGT
GTTTTCTGGACAGTGGTATTTGATCATGTTGTGTTTATTTTGGTAACAAGTTTTGATCAT
TATCAAAAAGATCACTCTTGTAAGTTAGTTTTTCCACAATAAATCAACTATTTATATGA
AAGTTTTTATATCAGGACTACTGCCTTTACTTATATAAACTTTGAGAAATTTTTT

AU095068 (SEQ ID NO:140):

TGGTGCTTCTCATTTGGGCTGCTGCTGCTGCTATTGCAAACTTGGTGCTCAAGCTACAG
CTGCACTTGGTACTGTGAAATCAAATGCTATTCAAGCGTTCAACAAGGTTTNNCCATTGA
TAGAACAGTTAGACAGGTCAGCCATGGAAAATACTAAAGATGGCCCTGGGGGATATCTTG
AAAATTTTGACCAGGAAAATGCACCTGCTCATGATTCGAGAAATGCCGCCTTGAAGATTA
TCTCTCTGGCGCACTGTTTGCAGTGTGGCAGTAATTGGGGCCAAATATTTGCCTCGTAA
GAGGCCCCCTTCTGCTATTAGGAGTGAGCATGGATCTGTGGCAGTTGCTAATAGTGTGA
CTCTACTGATGATCCTGCACTAGATGAAGATCCAGTACATATTCCTAGAATGGATGCGAA
GCTGGCAGAAGATATTGTTTCGCAAGTGGCAGAGTATCAAATCTAA

"Replacement Sheet"

FIG. 8 continued 10/40

AU183658 (SEQ ID NO:141):

ATCATAAGAAGCGCCAAGAAGGGCTTCAAGGTGCGAGAAACATTTTGTGGAGCGTTGGCA
GAGGAGGTATTGCTACCGTTGGAGGAGGATTTTCTCGTGAAGCCTTCATGAACGAGGCTT
TTTTGAGGATGACATCAATTGAACAGATGGATTTCTTTTCAAAAACACCGAATAGCATTCTC
CTCTGAATGGTTTGAAATTTACAATGTAGCACTTGACATGTCGCTCAAGCAATTATAA
GTAAAAGGCCACAATTCATCATGATGGCGGATGATCTTTTGAACAACCTCCAGAAGTTCC
ACATAGGTC

AU058418 (SEQ ID NO:142):

ATCATAAGAAGCGCCAAGAAGGGCTTCAAGGTGCGAGAAACATTTTGTGGAGCGTTGGCA
GAGGAGGTATTGCTACCGTTGGAGGAGGATTTTCTCGTGAAGCCTTCATGAACGAGGCTT
TTTTGAGGATGACATCAATTGAACAGATGGATTTCTTTTCAAAAACACCGAATAGCATTCTC
CTCTGAATGGTTTGAAATTTACAATGTAGCACTTGACATGTCGCTCAAGCAATTATAA
GTAAAAGGCCACAATTCATCATGATGGCGGATGATCTTTTGAACAACCTCCAGAAGTTCA
ACATAGGTTCTCATTATGCTTATGATAATGAGATGG

BE490117 (SEQ ID NO:143):

CAGTGCTTGCAATTGGAGGGCACTTACTGGAGGACCGCCCGCCCAAGCGGTTCAAGCAGG
ATGTGGTGCTGGCAATGGCGCTCGCTTATGTGGATCTATCAAGGGACGCAATGGCGGCTA
GCCCTCCAGATGTAATCCGCTGCTGTGAGGTGCTTGAAAGGGCTCTCAAGCTTTTGCAGG
AGGATGGGGCAATCAATCTCGCACCTGGTTTGCTCTCACAATTTGATGAAACTCTGGAGG
ATATCACACCTCGTTGTGTTTTGGAGCTTCTTGCCCTTCCTCTTGATGAAAAACATCAGA
ATGAACACCAAGAAGGTCTTCGTGGTGTGAGAAACATTTTGTGGAGTGTGGCAGAGGAG
GTATTGGTACTGTTGGAGGAGGATTTTCGCGTGAAGCCTACATGAATGAAGCCTTCCTGC
AGATGACATCGGCGGAGCAGATGGATTTCTTCTCAAAAACACCGAATAGCATACCGCCTG
AATGGTTTGAAATCTATAGCGTGCACTTGCAAATGTTGCTCAAGCAATTGTAAGTA

BG607272 (SEQ ID NO:144):

ACACCTCGTTGTGTTTTGGAGCTTCTTGCCCTTCCTCTTGATGAAAAGCACCAGAGTAAA
CGCCAAGAAGGTCTTCGTGGTGTGAGAAACATTTTGTGGAGTGTGGTAGAGGAGGTATT

"Replacement Sheet"

FIG. 8 continued 11/40

GCTACTGTTGGAGGAGGATTTTCNCGTGAAGCCTACATGAATGAGGCCTTTTTGCAGATG
ACATCAGCGGAGCAGATGGATTTCTTTTCAAAAACGCCAAATAGCATACCACCTGAATGG
TTTGAAATCTATAGTGTGGCACTCGCAAATGTTGCTCAAGCAATTGTAAGTAAAAGGCCA
NAGCTCATCATGGTGGCAGATGATCTTTTCGAACAGCTCCAGAAGTTCAATATAGGTTCT
CAATATGCTTATGATAATGAATTGGATCTTGTGTTGGAAAGGGCACTTTGCTCATTGC

BI949952 (SEQ ID NO:145):

GCGAGCATGAGTCCGTGGCAGTTGCTAATGTTGTTGACTCAGGTGATGATGACGAACCAG
ATGAGCCCATAACAGATTCCTAAAAATGGATGCGAAGCTGGCAGAAGATATTGTTTCGCAAGT
GGCAGAGCATCAAATCCAAGGCCTTGGGATCAGATCATTCTGTTGCATCATTGCAAGAGG
TTCTTGATGGCAACATGCTGAAGGTATGGACGGACCGAGCAGCAGAGATCGAGCGCAAAG
GCTGGTTCTGGGACTACACGCTGTCCAACGTGGCGATCGACAGCATCACCGTCTCCCTGG
ACGGACGGCGGGCGACCGTGGAGGCGACAATTGAGGAGGCGGGTCAGCTCACCGACGCAA
CCGACCCCAGGAACGATGATTTGTACGACACTAAGTACACCACCCGGTACGAGATGGCCT
TCACCGGACCAGGAGGGTGGAAAGATAACCGAAGGCGCAGTCCTCAAGTCGTCATAGGGCG

AV833644 (SEQ ID NO:146):

GAAACTCTGGMNGNAGATCACCCCTCGTTGTGTTTTAGAGCTTCTTGCCCTTCCTCTTGA
CGAGNAAGCACCAGAGTAAACGCCAAGNAAGGTCTTCGTGGTGTGAGAAACATTTTGTGG
AGTGTGTTGTTAGAGGAGGTATTGCTACTGTTGGTGGAGGATTTTCACGGGAAGCCTACATG
AATGAGGCCTTTTTGCAGATGACATCAGCTGAGCAGATGGATTTCTTTTCAAAAACGCCG
AATAGCATACCACCTGAATGGTTTGAAATCTATAGCGTGGCACTCGCAAATGTTGCTCAA
GCAATTGTAAGTAAAAGGCCAGAGCTCATCATGGTGGCAGATGATCTTTTCGAACAGCTC
CAGAAGTTCAATATCGGTTCTCAATATGCTTATGGTAACGAGATGGATCTTGCGTTGGAA
AGGGCACTTTGCTCATTGCTTGTGGGAGACATTAGCAACTGCAGAACTTGGCTTGCGATT
GATAATGAATCTTCACCACATAGAGACCCGAAAATTGTAGAGTTTATTGTGAACAACTCT
AGCATTGACCACCAGGAGAATGATCTTCTTCAGGCCTGTGTAAGCTTTTGGAGACTTGG
CTTGTCTCAGAGGTTTTCCCTA

AV921157 (SEQ ID NO:147):

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FIG. 8 continued 12/40

TGGCTTCACCTGNAAATCCAGCACTAAGTTTCTCTTATCACCAACCCAAGGATCTCTTCT
AGCCTAGCAATAATCCGAATAGAACACACCGAAAAACAAAGCTCATCGCTGACTAACTGA
CTAACCAAACCTATCTCCGTCTTCCAAACTGACAAGAGCCTAGACTAGACTGCTTATTTAC
ACACCAGAAAAACACGGGAGGAATCAATCAACAAGGTTTACTGCACGCTGAACGCCCTAT
GACGACTTGAGGACTGCGCCTTCGGTTATCTTCCACCCTCCTGGTCCGGTGAAGGCCATC
TCGTACCGGGTGGTGTACTTAGTGTCGTACAAATCATCGTTTCTGGGGTCCGGTTGCGTCG
GTGAGCTGACCCGCCTCCTCAATTGTGCGCTCCACGGTCGCCCCGGTCCGTCCAGGGAG
ACGGTGATGCTGTGATCGCCACGTTGAACAGCGTGTAGTCCCAGAACCAGCCTTTGCGC
TCAATCTCTGCTGCTCGGTCTGTCCATACCTTCAGNATGTTGCCATCAAGAACCTCTTGC
AATGATGCAACAGAATGATCTGATCCCAAGGCCTTGGATTTGATGCTCTGCCACTTGCGA
ACAA

BE917942 (SEQ ID NO:148):

TATGGGTCTGTGGCAGTTGCTGACTCTGTTGATGGTCTGGGAGCAGATGAAGAGCCACTA
GAAATTCCTAGAATGGATGCAAAGTTGGCTGAAGATATTGTTGCAAGTGGCAAAGTATC
AAGTCCAAGGCTTTGGGGCCAGAACACACTGTACGGCATTGCAAGAGATCCTCGATGGC
AACATGCTGAAGGTATGGATGGACCGAGCCACAGAGATTGAGCGTCACGGTTGGTTCTGG
GAATACACACTCTCCGACGTGACGATCGACAGTATCACCGTCTCCATGGACGGTCGACGG
GCAACTGTGGAGGCGACGATTGAGGAGATGGGCCAACTTACCGACGTAGCAGACCCAAAG
AACAACGACGCCTACGACACAAAGTACACCGCTCGGTACGAGATGAGCTACTCCAAGTCC
GGAGGGTGGAGGATCACCGAAGGAGCAGTCCTCAAGTCGTAGAACGGTCGTGCAGCAGGA
GTAGGCGAGTAGGGGTTGCTCAACTCCCATTCTTTTTCTTTTGCACCAAGTGTATGTAAA
TAAACAGTGTGAGCACAGGTTCTTTCTCTCTCGGAGAGAGTTTGGTTAGGTTGATTAGT
GATGAGTTCCTGAGGCCGAGAGAATTTGTCATCTAGTTTGTATTGATAGAGAT

BE918523 (SEQ ID NO:149):

GCACGAGGATAGAACAGCTAGACAGATCAGGCAAGGATACCCAGGTGATGATCTTGAGA
AATCTCTTGAAAACTTGCCCAAGAAATGTTGCTGGAGATGCTATCCATGATTCCAAAAA
TGCCGCTTTGAAGATTATCTCTGCTGGTGCACGTGTTGCACTATTTGCAGTAATAGGTCT

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FIG. 8 continued 13/40

GAAGTGCTTGCCTCGTAAGAAGTCACTTCCTGCTCTTAAGAGCGAATATGGGTCTGTGGC
AGTTGCTGACTCTGTTGATGGTCTGGGAGCAGATGAAGAGCCACTAGAAATTCCTAGAAT
GGATGCAAAGTTGGCTGAAGATATTGTTTCGCAAGTGGCAAAGTATCAAGTCCAAGGCTTT
GGGGCCAGAACACACTGTCACGGCATTGCAAGAGATCCTCGATGGCAACATGCTGAAGGT
ATGGATGGACCGAGCCACAGAGATTGAGCGTCACGGTTGGTTCTGGGAATACACACTCTC
CGACGTGACGATCGACAGTATCACCGTCTCCATGGACGGTCGACGGGCAACTGTG

BM498278 (SEQ ID NO:150):

GCCACAGGCCGCCACCGCCTGGCCCCCTCCACCTGCCGCTCCGCCAGCCGCTGGGCCGACC
GCCTCTTCGCCGACTTCCACCTCCTCCCCGCCGCCGCCGACCCGCCAGCCGCCGCTCCT
CTTCCTCCTCGTCCCCGTTTCGTCCCGATCTTCCCCGAAGCCGCCGACCGCGCCTTGCCCC
TCCCGGTGACTTCTACAAGATTCTTGGTGCGGAGCCACATTTCTAGGCGATGGCATTC
GGAGGGCGTTTCGAGTCGCGGATAGCTAAGCCACCTCAGTATGGGTACAGCACAGAAGCTC
TTGCTGGGCGACGGCAAATGCTGCAGATTGCCCATGATACTCTCACAAACCAGAGCTCGC
GCACCGAGTACGACCGTGCGCTTTCCGAGGACCGTGATGCGGCACTCACCATGGATGTTG
CCTGGGATAAGGTTCCAGGTGTGCTGCGTGTGCTTCAGGAGGCTGGGGAGGCACAACCTG

BM498757 (SEQ ID NO:151):

AGCAATGTGGGCAAGTGCGACACTATAGATCTCAAACCATTAGGTGGTATGCTATTTCGG
TGTTTTAGAGAAGAAATCCATCTGCTCAGCTGATGTCATCTGCAAGAAAGCCTCATTTCAT
GAAGGCCTCACGAGAAAAATCCTCCTCCAACAGTAGCAATACCACCCCTGCCAACACTCCA
CAATATGTTTTTGCACCTTGCAGACCTTCTTGGCGTTTATTTTTATGTTTTTCATCAGT
AGGAAGAGCAAGAAGCTCCAATACACAACGAGGTGTAATCTCCTCCAAAGTTTCATCAAT
CTGTGCAAGCAGTTCAGGTGCAAGATTGCTTGCACCATCCTCCTGCAGGAGCTTCAGTGC
CCTCTCAAGCACCTCACAACAGCAGATTACATCTGGAGGGCTTGCTGCCATAGCATCCCT
TGATATGTCCACATAAGCCAATGCCA

AW331058 (SEQ ID NO:152):

CGCGTCGACGTATAGAGTCTGCATCCATGTTGCCCTTGAATGAAGCGTCTGCAAAAAGAAGG
CTCTTTTATCACCAAGTCGTGTCAGGAAGCATTTTGAAAAATATATCAAAATTTCTTTGGCT

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FIG. 8 continued 14/40

GAGTGATAGGCCTAATTCAAATAGCAAAGGAAGTGATAAACACCCAGCGGTTAATGATAT
TACTGCTGCAGTTTGCAGCAAAAGATGGATATTCAAGAAGCAGAAACACTTGTAACA
GTGGCAAGACATAAAAATCTGAAGCTCTTGCCCTGACTATCAAACCTGACATGCTACCTGA
GATTCTTGATGGTTCAATGCTCTCTAAGTGGGAAGACTTAGCGTTATTAGCAAAGGACCA
GTCTTGCTATTGGAGATTTGTGCTGCTAAATCTTAATGTTGTTGAGCCGAGATAATCTT
GGATGAAATAGGTGCTGGTGAGGCAGCAGAAATTGATGCTGTACTTGAGGAAGCGGCTGA
GCTTGTTGACGATTCCCAGCCCAAGAAACCGAGTTATTACAGCACATATGAAGTTCAGTA
CGTATTGAGGAGGCAGAATCATGGATCTTGGAAAATCTCCGAGGCTGCTGTCCGGGACCT
GACGTGATTTCTGCCAACTCGGCAAACGGGCTACACAACCATTGGCGTATAGGCGGC

BE641509 (SEQ ID NO:153):

GTGGTGTCTTTGCTCGTGTTCTTGATACACAAGGGATGAGTATATGAAGGCAGCTTTTT
CTCGAATGACAGCTGCTGAGCAAGTAGCTTTGTTCAAAATACACCCAGTAATATCCCAG
CAGAGAGTTCTGAGGTTTACACAGTTGCGCTTGCTCACATAGCAGAGGGATTTGTTGCAA
AGAAGCCGCAATTGATTCAAGGAAGCTGATTCACTCTTTCTTCAGCTTCAGCGAACAAATG
CCTCATCATCTAGTTTGCTAGTTACTGGTGGTCTACGGCCATTATCAAGTCTGCAGCTTG
ATTTTGCTTTTGAACGAGCCATGTGCAAACTGCTCCTAGGAGAACTGGATGGTTGTCGTG
CATGGCTAGGTTTGATGATACAACTCTCCATATAGAGACCCTGCAGTGACTGATTTTG
TTATAGCTAATTCTTTTGGAAGTGAGGAAGGTGATTATTTACCAGGCCTTTGCAAGTTGT
TGGAAGTTGGTTGAGGGAAGCGGTGTTTTTCCCAACCCGTCAACAGAAAAGTGAGGT
ACAAGTTGAGGGAGTATTTTTTATGATGCAAGGAGAAAAAAGCCGCCGTGAATTTTTTC
GCGGGGGCGCTATGAAAAATATATTCAACCTTTTTTTGTTGGGGCGTCGTCTACAAAG
AATGATGGAGTGTCAATTGTTGCTTTTGAGGTGACGAAGGGGCGGCGCTCCTCTTAAGGG
ATCGTCCGTGGGGGCGCGCTCCCATATCGCCATCTTCGGGACACCTTGTTTCGTGGGTG
AAATGGTGATGTCTTTTTTACCACGAACGTACATTATTCTTATAATATAAGCGTGCGGC
AGCACTCTCAGCTTCGACGAAACAGCCTAAA

BI437111 (SEQ ID NO:154):

GAGAACGGAAGCTTTAGAAGTGGAGGTTGTCCCAAAATGGATGCTAGGTTGGCGGAAAT

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FIG. 8 continued 15/40

TATGGTTCGAAGATGGCAAGCAGCTAAAGCTCGAGCACTTGGTTCTGCTCATGATATGGC
GGCTCTTCCTGAGGTGCTGGAGGGCGAGATGCTGAAGAGCTGGACAGACCGTGTTAGTGA
CGTCAAGAGAAATGGTTGGTTTTGGGAATACACTCTCCTTGGTCTTCACATTGATAGTGT
AACAGTAAGTGACGATGGGAGGCGAGCAACTGCGGAAGCCACTTTGCAAGAGGCAGCCCG
CTTGGTGGACCGCAACAACCCTGACCACAATGATTCTTATAGAAGCACTTACACTACGCG
ATATGACCTCCGGCATGGCATAGATGGTTGGCGAATCAATGGAGGAGCTGTGCTGCGTAC
TTGATTCTGAGATTTTCATCTCCGGATCATGTTGACTTGTTAGGCAGATCGACTAGTTGCA
ACCCTTGCATGCTACGAATGAGTAGTCTTTTTGGATATTTTGATCCATCATGCAGCTTTG

A

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FIG. 8 continued 16/40

Prochlorococcus marinus sp. MED4 (SEQ ID NO:155):

ttggaacttccattagatcacttttcgtttaataggcgtaagccccctcagcaacatctgaggaaatattaagggtc
ttcca
attacgcttgataaaaactcctgatgaaggattcacgtacgaggttttaactcaaaggctcggaattgcttcgcct
tactg
cagatttgcttacagatccagatagtagaagagattacgaaaatttattactaaatggagcatcaggtttagatt
tatct
tccaatagagaggttgcaggattaatttctcctttgggaatcgggctcttctaaagaagcctttaaaataacaaga
aaagc
attgcaaccccccaactcctgcattgggttagcagtagagaagctgatcttaccttgtagcggctttaacatc
tagag
atgctgcaatacaagagcaagatcaaagatcttactcaaatgctgcagattttttacaagaaggcatacagcttc
ttcaa
agaatgggcaaac taggggaattacggaaaactcctgaggaggacttagtgctcgttcttccgtatcgaattctt
gattt
gttaagtagagatctaaatgattatgactcgcataaaaaagggtttaagtatgctggaaaatttaataatcaaaag
aggtg
gattagaaggaaaaataaatctgaatataatgattttctaaatcagcaagaatttgaatctttctttcaacaaa
taaag
ccattcttgactgttcaggatcagatagattttatttttagaattacaaaaagggggttcaagtgaagcaggattt
tagc
ttttttatctttaacagcaattgggttttgcaagaagaaaacctgcaaaattattcgaagctcgaaaaaatattaa
aaaac
taaatttatcaggacttgactcaatgccattaataggttgccttgatttgcttttagcagatgttgagcaatcct
cagca
aggtttttaagtagttccgatgagaagttaagagattgggtgaataattatcctggagaaaaattagaagcaata
tgtat
tttttgtaaaaattgggttagaaaatgatgttttggttggttatagggatattgatttaaaagaaatcgatttaga
ctctt
ggtttgaagatagagaaatccaagaatttattgagcaaatagaaaagaagtcaaatagaactgtgtttaagtctg
ggcct
caaaataaacctatttttcaagcccaagaatctttaaaagattcaagtacgggccctgatttaaatcggataat
tttga
agaaggccgattacctttgcctggaggagtaagagaagatgggtcaagaagtattgaagaaaatatttatacaga
tgaga
ttattaaaaacaaatcaatagaattttataagtagcgaatagaaaaaattgctgaattaaaatttgatttgag
aagcc
ttagagaactacagaatatttaataaatcttcctacctaacatatctgtatgcttttttgattttatttgctttt
ggcct
agggtgttgatttgtaagaaataatctcaaaaaacccgtgcaggaaaaagaaataattgataactcgttatcgat
aaatg
aaaataagaatgtcttttatgaagggttaaatcaagatgataaaaagaaagttctcgataactcaaaaattattc
tctca
gataatgcagaaaaagttattttttcagggtgaagaaataaaaaactgcttctccctccttagaaaaaatagaaaat
ttaat
taatacatggcttgtaacaaaagtaaatcttagcaggaaaagggtgaaattaatttatcaaagatagttcaaga
tgatt
tgattgatagattaaagaaggaaagagaacttgatattcaaaaagggtatctacaaaaatatcaatgctaatatcg
aaaat
attgtacttttaactcaaacggcatcaagaatatcagtatcagttgacttaaagtattcagaaaaaatattaaaa
ataga
tggggaattgataaatgaaacaactttcactccttttttgaaagttaaataatattttagggtttctcaaataactc
ctgga
aattagttgactacattagtggtgtag

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FIG. 8 continued 17/40

PROTEIN (SEQ ID NO:156) :

LELPLDHFRLIGVSPSATSEEILRAFQLRLDKTPDEGFTYEVLTORSELLRLTADLLTDPDSRRDYENLLLNGAS
GLDLS
SNREVAGLILLWESGSSKEAFKITRKALQPPQTPALGSSREADLTLLAALTSRDAAIQEQDQRSYSNAADFLQEG
IQLLQ
RMGKLGELRKTLEEDLVSLLPYRILDLLSRDLNDYDSHKKGLSMLNLI IKRGGLEGKNKSEYNDFLNQQEFESF
FQQIK
PFLTVDQIDLFLELQKRSSEAGFLAFLSLTAIGFARRKPAKLFEARKILKKLNLSGLDSMPLIGCLDLLLADV
EQSSA
RFLSSSDEKL RDWLN NYPGEKLEAICIFCKN WLENDVLVGYRDIDLKEIDLDSW FEDREIQEFIEQIEK KSNRTV
FKSGP
QNKPIFQAQESLKDSSTGPD LN SDNFEEGR LPLPGGVREDGQEVIEENIYTDEI IKNKSIEFYKYAIEKIAELKF
VFGEA
LENYRIFNKSSYLTYLYAFLILFAFGLGVGFVRNNLKKPVQEKEIIDNSLSINENKNVFYEGLNQDDKKKVL DNS
KIILS
DNAEKVIFSGEEIKTASPSLEK IENLINTWLVNKS KFLAGKGEINLSKIVQDDLIDRLKKERELDIQKGIYKNIN
ANIEN
IVLLTQTASRISVSVDLKYSEKILKIDGELINETTFTPFLKV KYILGFSNNSWKLVDYISGV*

"Replacement Sheet"

FIG. 8 continued 18/40

DRAFT *Prochlorococcus marinus* sp. (SEQ ID NO:157):

MRNA

gtggacctgccaatagatcatttccgcttgctgggtgtcagtccttcggcagacagtgaggcgattttgcgggcc
ttgga
gttgaggttgatcgctgccctgaccaaggtttcacccatgaggtcttaattcagcgggcagaattgttgcggt
ttcag
cagatttgctgactgatccgccacggcgtcaggcctatgagactgccttggtggagctcagtcgtgatcatccag
gtgag
accgccggtcttgatgtgtcacctagtagagaggtggcagggctgatcttgctgtttgaagcgaattcttctcat
gaggt
ttttcatctcgctctcagggattgcaac'cgccccagtc'cccgacgctaggtagcgaacgagaagctgacctcgc
tttgt
tggtggcactggcctgtcgggctgcagccgctgaggaacaggaacaacggcgttatgaagcagcagcgtctcttc
tgcat
gacgggatccagttgctgcagcggatgggcaagctctccgaagagtgccacaagcttgagaacgatttagatgcc
cttct
gccctatcgcattctcgacttattgagtcgggatcttggtgatcaggtttctcaccaggaaggactgcgcctact
tgaca
actttgtgagccagagaggaggtcttgagggaacggcccatcgctgcacctgggtggtcttgatcagtcggaat
ttgac
aacttcttcaagcagatcagaaagtttttaactgttcaggaacaggttgatcttttcctgcgctggcagcaagcc
ggatc
agcagatgcgggtttcctgggtgggttggtctctgctgctgttggttttcgcgctcggaagcctgaacgggtgca
ggaag
ctcggcagcacttagagaggcttcaactggatggatgcgacccgttgccgatgctgggttgcttgacctcttg
tcgga
gatgtggg'ccgcgctcaggagcgttttctgcgcagtacagatcctcgagtgaaggactgtcttaacagccaccct
ggcga
tgaattggctgctttttgtgagtactgccgctcttggtgcgaggggacgtgcttcccgggttatagggatgtgga
tgctg
aggccgttgatctagaggcttggtttgctgatcgggatgttcaggcttatgtggagcgctggaacgcagcga
atcgt
gcttcttctttaggtaaaggccttctcaggatcgtctgtgaagcaacccttcccttgggcgcctcttgatcccgat
gggat
tttgccctctctcttggtgggctgatgttggtcaacctgcagctgatcagagctctgatgagtttgccagcga
tggtat
tggcatggattgatcggttagcagatctgccacgcccgcgcggccgggtgctgatcggttcggttgctcttgcgg
cctg
attgcagcctttgcaggcttcagtttggttgccaacgtcctcgctacgtcagttagtagcggtgctgatcagcct
caagt
cacagcacctcctacagccacactgcaagaggaggtcctcatgcctcaagtccctgtcagcgtgtgggtgagcc
gctta
ctttggagcagccgaatgaggcacagctcaaaggcctgcttcaggcctggctcagcaacaaggcagtcgtgcttg
ccggt
ggcaagagtgatgcactgcctgaggtcgcaagagatccattggtgcagcgcgtggcgcaagagcgtgccagggat
gctgc
tttagctcagaccagaaggttggtggccagcatcagctctgtagaggtgggtgagtcgaacgccgcagcgtattga
gctga
atgccggttgtagcctatcgcatcaacgcgttgatgctgccggcaaggttggtgaccaaacgccccaaaaagatc
tctcg
gtgacttacatccttggtcgatcccgatcggtggcgccctgcatgaatacatcagcggcaataa

PROTEIN (SEQ ID NO:158):

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FIG. 8 continued 19/40

VDLPIDHFRLIGVSPSADSEAILRALELRDRCPDQGFTHEVLIQRAELLRLSADLLTDPPIRQAYETALLELSR
DHPGE
TAGLDVSPSREVAGLILLFEANSSHEVFHLASQGLQPPQSPTLGSEREADLALLLALACRAAAAEQEQRREYAA
ASLLH
DGIQLLQRMGKLSEECHKLENDLDALLPYRILDLLSRDLGDQVSHQEGLRLLDNFVSQRGGLEGTAPSPAPGGLD
QSEFD
NFFKQIRKFLTVQEVDLFLRWQQAGSADAGFLGGLALAAGVFSRRKPERVQEARQHLERLQLDGCPLPMLGCL
DLLLG
DVGRAQERFLRSTDPRVKDCLNSHPGDELAACEYCRSWLRGDVLPGYRDVDAEAVDLEAWFADRDVQAYVERLE
RSEN
ASSLGKAFSGSSVKQFPWPAPLDPDGILPLSLGGPDVGQPAADQSSDEFASDGMWIDRLADLPRPTRPVLIGSV
VFAAL
IAAFAGFSLFGQRPRTSVSTAADQPQVTAPPTATLQEEVLMQVPVSAVVEPLTLEQPNEAQLKGLLQAWLSNKA
VVLG
GKSDALPEVARDPLVQVQERARDAALAQTQKVVASISSVEVVSRTQPRIELNAVVTYRDQRVDAAGKVVDQTP
QKDL
VTYILGRDPDRWRLHEYISGK*

"Replacement Sheet"

FIG. 8 continued 20/40

Synechococcus sp. PCC7002 (SEQ ID NO:159):

GTGCGCATTCCGCTCGACTATTACCGCATCCTATGCGTCCCCGCCAAGGCAACCACTGCCCAAATTACCCAAGCC
TATCGCGATCGCCTCTCCCAATTTCCCGTCGCGAACATAATGCCTTGGCCATTGAGGCCCCGCAACCGGATTATC
GAGCAAGCCTTTGAGGTGTTATCCCAAACAGAAACCCGCGCGTCTACGACCATGAGCTGTCGGGCAATATGTTT
CGTTCCCTCGTCCCCAGCCGTCCGAAACTGCCTTTTCCCGATCGCCCCCTCCAGTGACACAGAGTTAGAAGCCCTG
ACAGCCCACCAACCAACCATTTGACATCGCGGAAAAAGATTTACTGGGGGGGACTGCTGTTACTCCTCGACCTGGGG
GAGTACGAATTAGTGCTGAAGTGGGCTGCCCCCTACCTCAAGGGCAAAGGCAAGCTGGTCAAGGAAGGGAAATTT
GGGGCCGTGCAAAATCGTCGAGCAAGAACTACGGCTTTGTTTGGCCCTGGCCCACTGGGAATTGAGCCGGGAACAG
TGGCTCCAACAACATTATGAACAGGCGGCTCTCTCCGGTCAGAAGAGTCAAGAGCTATTGGTAGATGTGGCACAA
TTTGACAGACCTCCAACAGGAAATTCAGGGGATCTCAATCGCCTCAGACCCATCAAGTTCTAGAACTTCTGGCC
CTACCCGAATCAGAAACCAAGAGCGACAACGGGGCTTACAACCTGCTCCAGGAAATGTTGAGTGCTCGCGTGGGG
ATTGATGGCCAGGGGGACGATCAGTCGGGTCTAAGTATTGATGATTTTTTTCGCTTTATCCAGCAGTTACGCAGT
TATCTAACGCTGCAAGAACAGTTGGATCTCTTTGTGGCAGAATCAAAGCGACCTTCGGCGGCAGCGGCCCTACCTA
GCGGTGTATGCTCTCTTGGCTGCTGGGTTTTTCGCAACGGAAACCTGACCTGGTTCGTGCAAGCCAGACCCCTATTA
AAACGCCTCGGCAAACGCCAGGATGTTTTCTTGGAGCAATCAATCTGCGCCTTACTTTTAGGTCAGCCGTGCGAA
GCCAATCAACTGTTAGAACAAGTCAGGAACAGGAGCGATCGCCTACATTCAAGAGCAGTCTGAGGGGGGACCG
GATCTACTCCCAGGCCTATGTCTCTACGGGGAACAGTGGCTGAAGACAGAGGTTTTTTTCCCATTTCCGCGATCTC
CGGCAACGGCTTGAAGATGGCTCTGTTTCGTTGACGGCTTACTTCGCGGATCCTGAAGTGCAGCAATATCTTGAC
GATCTCCTCACGGAGGCTGTCCCCACACCCACACCATCCAGACACAGAAAGTACAGCGGCCCCGTGCGAAAAAG
CCACCGGAAACATTACAGTCAGAAACCGGTGTTTCGCGCATCCCAGTCGTCCCGCCAAGGTTGATTCTTTGAG
GATCTCGTCACTCAAACCTCCGCTACAGTTCCCCCGGCACCGCCTTCTCCTGGTGTAGCACCTGTAACCTGCGGCA
TTAAACCCAGACCCGGAAGCGTCTTCTGCTTCGTCAAATCAGTTTCGTCAAAAAAGTCTATCGGGCCTTGGGGG
GCGATCGCCGCTATCGTGGGGAGTGTTCGCTGGTTCGTGGGCTGGTGCGAATTTTGTCTGGCCTAACTACCCAG
GAACCCCTTACAGGTCACCCCTCAACGGTGAGCCACCCCTAACGATCCCCAGCTTAGACACCGCCGAGGCAAATAAT
AATCCGGAAGATGGAGCGACCGATACAACGACAACGCCTGCGCTCAATGAGGCGATCGCCGCTGAGGTGATTCAA
ACTTGGTTTGTAGAGTAAAGCTAGAGCCTTTGGCCAAGACCGTGATTTGGCGGCTCTAGAAAAATATTTTGGCAGAA
CCGTCCCTGTCCCCTGGCGCAGTAGTGCCCAAGCCGTCCGCGAGCGCTGGTACCTACCGCACCTATGACCACAGT
TTGACCATTTGAAACGGTGAGCTTCAACCCAGACCAACCAATGTGGCGACCGTTGAGGCCCAGGTGCAGGAAAAAG
GCAGATTATTACCGGGCGAATGGGGAACGCGATCCCGGCCAGTCCTATGATTCTGACCTGCGTGTCCGCTACAGC
TTGGTGCGCCAAGGCGATCGCTGGTTGATTTCGTTCTTCCCAAACCTGTAA

Protein: (SEQ ID NO:160):

>Scc_7002_Sequence 1 ORF:57453.. 55303 Frame -2

MRIPLDYYRILCVPAKATTAQITQAYRDRLSQFPRREHNALAEARNRIIEQAFEVLSTETRAVYDHELSGNMF
RSLVPSRPKLPFPDRPSSDTELEALTAHQPTIDIAEKDLLGGLLLLLLDLGEYELVLKWAAPYLKKGKLVKEGKF
GAVEIVEQELRLCLALAHWELSREQWLQQHYEQAALSGQKSQELLVDVAQFADLQQEIQGDLNRLRPYQVLELLA
LPESETQERQRLQLLQEMLSARVGIDQGDDQSGLSIDDFLRFIQQLRSYLTVQEQLDLFVAESKRPSAAAAAYL
AVYALLAAGFSQRKPDLVVQAQTLKRLGKRQDVFLQSIALLLGQPSEANQLLEQSQEQAIAIYIQEQSEGAP
DLLPGLCLYGEQWLKTEVFSHFRDLRQRLEDGSVSLTAYFADPEVQOYLDLLTEAVPTPTPHPDTESTAAPSEK
PPETLQSETGVSPHPSRPKVDSEFEDLVTQTPATVPPAPPPGVPVTAALNPDPEASSASSKSVSSKKSIGPWG
AIAAIVGSVLLVVGLVIRLSGLTTQEPLQVTLNGEPPLTIPSLDTAEANNNPENGATDTTTTPALNEAIAAEVIQ
TWFESKARAFGQDRDLAALENILAEPSSLRWRSSAQAVRSAGTYRTRYDHSLLTIETVSFNPDPQPNVATVEAQVQEK
ADYYRANGERDPGQSYSDSLRVRYSLVRQGDRLIRSSQTL

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FIG. 8 continued 21/40

ACCESSION AF421196 (SEQ ID NO:161):

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1  cttgccgact aaaggctaag catcgccatt ccttagatta aagcagtctg tcggcggcgc
61 tgtgccggtt aacaccagtc tgtcgctgac agcgggtgcct ttctggggct tgcctgtggg
121 gcgagtaacc gatcgctggg ataagagttg gtgcttctgg ctctcaagaa tagggttttc
181 cgtcgcgatat tcccgatcac atccccctgt gtctgctacg gagataacgc cgatcactca
241 acagaattgg taagttgacg gtcaagttgg gatgatgaag tcggctcaag ctggcgatcc
301 ggatctggtg ggtgttctgt gcgtattcct ctcgattact accgaattct ctgtgttggc
361 gtgcaagcct cggcagacaa acttgccgaa agctaccgcg atcgctcaa ccaatcgccc
421 tcccatgagt ttccagagct ggcattgcag gcgcggcggc aactcctcga agcagcgatt
481 gctgagctga gtgatccga acagcgcgat cgctacgacg gccgcttttt tcaggcgggt
541 ctggaagcga ttgaaccaag cctagaactc gaagactggc agcgaattgg agccttctg
601 atcctgctgg aattggggga atacgatcgc gtttcgcaac tggctgagga actcctgcca
661 gactacgacg cgagcgcaga agtacgcgat cagttcgcg cgggtgatat cgccttggcg
721 atcgactatc cccagcaatc cctcggtcga gaatgccgtc agcagggtct gtacgaacag
781 gccgcccagc actttggccg cagccagtct gccctagccg atcatcagcg ctttcctgaa
841 ctgagtcgaa ccctgcacca agaacaagga cagctacggc cctatcgcat tttggagcgg
901 ttggcccagc ccttgactgc cgatagcgat cgccagcagg gtttgctgtt gttgcaggcg
961 atgttgagc accggcaggg cattgaaggc cctggggatg atggctcggg gctgaccctt
1021 gataactttt tgatgtttct ccagcaaatt cgcggtatc tgacctggc tgaacagcag
1081 ttgctgtttg aatcggaagc gcgtcggccc tcgcccgtg cgagcttttt tgctgtctac
1141 accctgattg cgcggggctt ttgcgatcac caacctcgt tgatccatcg cgccagcttg
1201 ctcttgcatg aactcaagag ccgcatggat gtgcacatcg aacaggcgat cgccagccta
1261 ttgctcggac agcccgaaga agctgaggcg ctactcgtcc agagccaaga tgaggaaacc
1321 ctcagccaaa tccgtgccct agcccaaggg gaagccctga tcgtcggttt gtgccgattc
1381 acggaaacct ggctagcgac caaggtattt ccggatttcc gcgacctcaa ggaaaggact
1441 gcgccgctgc agccctactt tgacgacccc gatgtccaga cctatctgga tgcgatcgtg
1501 gagttgccgt ccgatttgat gccaacgccc ctacccgttg agccgcttga ggtgcgatcg
1561 tcgttgctgg ccaaggaact gccgacccca gcaacgcctg gtgtagctcc acccctcgc
1621 cgccgtcgcc gcgatcgtc cgaacgtcct gctcgcacgg ccaaacgctt gcccttgccc
1681 tggattggtt tgggggttgt ggtggttctc ggcggtggaa caggggtttg ggcttggcga
1741 tcgctgtcca attccacccc gccgaccccg ccccccgtgg ttcaaacgct gcctgaggcg
1801 gtacctgccc cttcgcccgc gccagttacc gttgccctcg atcgggctca ggctgaaact
1861 gtgttgcaaa actggttggc cgctaaaagt gcagccttgg ggcctcaata cgatcgcgat
1921 cgcttagcga cgggtgctgac cggtgaggtt ctgcagactt ggcagggttt ttctagccag
1981 caggccaaca cccagctcac atcacagttc gatcacaagt taaccgtcga ctcagttcag
2041 ctcagtgcag gtgatcaacg agcagtagtc caagccaagg tcgatgaagt tgagcaggtc
2101 tatcgaggcg accagctgct cgaaacgcgc cgagatttgg gcttggtgat ccgctaccag
2161 ctcgtgcgcg agaacaacat ctggaaaatt gcttcgatta gtttggtgcg ctagggaattc
2221 gcaaggggtg aacccctgc ggtcttttct gtagatcccc tagagcgatc gcagaatgtt
2281 cagcgattcc tggatgtgcg cttgggcatt caagagtga tcaaaaatgt ggcgacctt
2341 gccctctttg tcgatcacat aagtgcgcgc acccggaatc acaaacaggg ttttgggcac
2401 gccataggtt tgacggaggc gatcgctgc atcgctcagc agttggaagg gcaagttgta
2461 tttctgggc
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"Replacement Sheet"

FIG. 8 continued 22/40

AF421196_1 (SEQ ID NO:162):

```
1 mripldyryi lcvgvqasad klaesyrdrl nqspshfse lalqarrqll eaaiaelsdp
  61 eqrdrydrf fgggleaiep sleledwqri gallillelg eydrvsqlae ellpdydasa
 121 evrdqfargd ialaialsqq slgrecreqqg lyeqaaqhfg rsqsaladhq rfpelsrtlh
 181 qeqgqlrpyr ilerlaqplt adsdrqqgll llqamlddrq giepggddgs gtlldnflmf
 241 lqqirgytl aeqqllfese arrpspaasf facytliarg fcdhqpslih raslllhelk
 301 srmdvhieqa iaslllggpe eaeallvqsq deetlsqira laqgealivg lcrftetwla
 361 tkvfpdfrdl kertaplqpy fddpdvqtyl daivelpsdl mptplpvepl evrssllake
 421 lptpatpgva ppprrrrrdr serpartakr lplwiglgv vvvlgggtgv wawrsrsnst
 481 pptpppvvt lpeavpaps apvtvaldra qaetvlqnwl aakaaalgpq ydrdrlatvl
 541 tgevlqtwgq fssqqantql tsqfdhkltv dsvqlsdgdq ravvqakvde veqvyrqdql
 601 letrrdlglv iryqlvrenn iwkiasislv r
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"Replacement Sheet"

FIG. 8 continued 23/40

AP003590 (SEQ ID NO:163):

ATTATGTTGATCACGGTGCAGGGGAAGTACGCTGTGCGAATTCGGCTAGATTACTACCGAATTTTAGGGCTACCG
TTAGCGGCAAGTGATGAACAACCTGCGACAAGCATACAGCGATCGCATTTGTCCAATTGCCGCGACGGGAGTATTCT
CAAGCAGCAATTGCTTCCCGTAAACAACCTTATAGAAGAAGCTTACGTGGTTTTATCAGATCCAAAGGAACGCAGC
AGTTATGACCAGCTGTATCTTGCTCACGCCCTACGACCCAGACAACCGCGGTACAACCAAAGTGGCAGTGGAAAAT
CGTGGGGACAGCAACAATGGTCATTTTCGATGTCCAAGCCTGAGCATCGAAGTTTCTCCGAGGAATTAATTGGT
GCTTTATTAATTTTGCAAGAGTTGGGAGAGTATGAACTCGTACTCAAGTTAGGTCGTAATTACTTAGGTAATCAA
AACGGCACAGCATCCACCAGAAAATGGCAATCATCGCACGCCTGAAGAATTTCTCGATAGTTCTGAACGTCCAGAT
ATTCTCTTGACTGTTTGCTTTGGCCTCATTAGAATTAGGGCGGGAACAATGGCAACAAGGCCACTATGAAAACGCT
GCTTTGCTTTTAGAGACTGGGCAAGAAGTGCTGTTTAGTGAAGGCATCTTCCCAGCGTCCAGGCAGAAATTCAG
GCTGATCTTTACAAATTACGCCCTTATAGAATTTTAGAATTACTTGCTTACCCAGGAAAAACCAATTGAACGC
CACCAAGGGCTGGATCTATTAGAAAGCATCTTAGACGATCGCGGTGGCATTGATGGTACAGGCAATGATCAATCA
GGCTTAAACATTGATGACTTCCCTCCGATTTCATCCAGCAATTACGCCACCACTTAACAGTGGCTGAACAACATAAG
TTGTTTGATGGTGAAAGCAAACGCCCTTCGGCTGTGGCTACATACTTAGCTGTTTATGCTTCCATCGCCAGAGGA
TTCACCCAAACGCCAGCCCGCTTTAATTCGTTCATGCCAAGCAAATTCGTATGCGTTTGTCTAAGCGGCAAGATGTG
CATTTAGAGCAGTCCCTGTGTGCGCTATTACTAGGGCAAACCTGAAGAAGCCACGCGAGTTTTAGAACTGAGCCAA
GAATACGAAGCTTTAGCCTTAATTCGAGAAAAATCTCAAGATTCACCCGATTTACTGCCAGGTTTGTGCTTATAT
GCCGAACAATGGCTGCAAAATGAAGTTTCCCCCATTTCCGCGATTTGTCCAGACAGCAAGCTTCCCTGAAAGAT
TACTTTGCTAATCAACAAGTACAAGCGTATTTAGAAGCCTTGCCCAACGACGCGGAAACCACTAATGAATGGGCT
GTAATTAACCGCCAATCGTTTCTCAACCCAGGGGCAATTCTTACTCTGGAGGAACGCCAGTCGCCAAACGTCCC
GTAGGGAAGGCGAACAGGCCAGGAGAAGCGTCCACAAGACCAGTTCCCCAACGTAGTCATCCATCAGAAGTAAAT
CGGCAGTTTCATCAAAAACAGAACCCCTGATCCCCGAATTACCAGAAAACATCAAAACACAGAAGACCAGAGTCTTCA
AATTTTACAACCTGCTAGAGAAAAATATATCGACCACAGATGCTTACACTGACAATTATCCACCAGAGATCCCTGTA
GAACGCGCCAGCAGACCTGTTTCAGCCGGGGGTAAGTGGTTATACCCAATCGACCCCTCCACGGCAAACTCCTAAA
CGCAGGAGACGCAAGAAGCCACAGGCAGTTGTCAACAGAGGACACAGTATTCATCAGCAACGCCAACCCCTCACCT
AGCACTCTAGGCCGGAACCAAGATTACTTTGGATAGTTTTGGGTTCTTTGGGTGGGATATTATTGTTCTGGCTG
ATAGTCTCAACGACTTTTGGGTGGTTAAAGAATGTATTCTTCCAGCACCATCTTTACAAGGTGAGCAATTATCG
ATTCAGATTAGTCAACACCTTTAGAGATTCTTGACAAAAATGCCAGATAACAATCCCCAGAGGTGAGTCTCACA
GAAGAAACGGCAAGGAAAAATAATTGAAAAATTGGTTGGCTACCAAGCTAGTGCTTTAGGCGCTGAACATAAAAT
GAGAGTTTAAACGAGATTTTAACTGGTTTCAGCGTTATCTCAATGGCGGCTAATTGCCTTGCAAGATAAAGCAGAC
AATCGTCATCGAGAATACAGTCATAGTGTCAAGGTAGACTCCATCAGTAAATCTGACATAGATCCCAATCGTGCA
AGTGTGGGGGCTACAGTCAGAGAGTTAACCAATTTTATGAGAATGGGCAAAAAGGGAAGTCTTCTGACGAAAGA
TTACGTGTACGCTATGAATTGATTTCGACAAGATGATATTTGGCGGATTTCAGAGGATGTCAGCCGCTATAAATTAA

BAB74406 (SEQ ID NO:164):

1 mlitvqgkya vripldyyri lglplaasde qlrqaysdri vqlprreysq aaiasrkqli
61 eeayvvlsdp kerssydqly lahaydpdna attkvavenr gdsnnghfdv qslsievsse
121 eligallilq elgeyelvlk lgrnylgnqn gtastrngnh rtpeefldss erpdilltva
181 laslelgreg wqgghyenaa lsletgqevl fsegifpsvq aeiqadlykl rpyrilella
241 lpqektierh qgldllqsil ddrggidgtg ndqsglnidd flrfiqqlrh hltvaeqhk1
301 fdgeskrpsa vatylavyas iargftqrqp alirhakqil mrlskrqdvh leqslcall1
361 gqteeatrvi elsqeyeala lireksqdsp dllpglclya eqwlqnevfp hfrdlrqqqa
421 slkdyfanqq vqaylealpn daettnewav inrqsfsqpr gnsysggtpv akrpvgkanr
481 pgeastrvpv qrshpsevnv qfhqnrtpdp elpetsnhrr pessnfttar enisttdayt
541 dnyppeipve rasrpvqpgv sgytqstppr qtpkrrrrkk pqavvnrghs ihqqrqpsps
601 tlgrktrllw ivlgsllgil lfwlivsttf gwlnkvffpa pslqgeqlsi qisqppliep
661 dknaiqispe vslteetark iienwlatka salgaehkie slneiltgsa lsqwrllialq
721 dkadnrhrey shsvkvdsis ksdidpnras vgatvreitq fyengqkgks sderlrvrye
781 lirqddiwri qrmsaain

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"Replacement Sheet"

FIG. 8 continued 24/40

NP_486747 (SEQ ID NO:165):

```
1  mlitvqgkya vripdyyri lglplaasde qlrqaysdri vqlprreysq aaiaarkqli
61 eeayvvlmdp kerssydqly lahaydpdna attkvavenr gdsnnghfdv qslsievsse
121 eligallilq elgeyelvlk lgrnylgnqn gtastrngnh rtpeefldss erpdilltva
181 laslelgreg wqgghyena lsletgqevl fsegifpsvq aeiqadlykl rpyrilella
241 lpqektierh qgldllqsil ddraggidgtg ndqsglnidd flrfiqqlrh hltvaeqhkl
301 fdgeskrpsa vatylavyas iargftqrqp alirhakqil mrlskrqdvh leqslcalll
361 gqteeatrvi elsqeyeala lireksqdsp dllpglclya eqwlqnevfp hfrdlrqqqa
421 slkdyfanqq vqaylealpn daettnewav inrqsfsgpr gnsysggtpv akrpvgkanr
481 pgeastrpvp qrshpsevr qfhqnrtppd elpetsnhrr pessnfttar enisttdayt
541 dnyppeipve rasrpvqpgv sgytqstppr qtpkrrrrkk pqavvnrghs ihqqrqpsps
601 tlgrktrllw ivlgslggil lfwlivsttf gwlnkvffpa pslqgeqlsi qisqppleip
661 dknaqiqspe vslteetark iienwlatka salgaehkie slneiltgsa lsqwrllialq
721 dkadnrhrey shsvkvdsis ksddidpnras vgvatvreltq fyengqkgks sderlrvrye
781 lirqddiwri qrmsaain
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"Replacement Sheet"

FIG. 8 continued 25/40

DRAFT Nostoc punctiforme analysis files

Version 31may01 - Contig493 Gene 84 (SEQ ID NO:166):

MRNA

GTGCGAATTCGCTAGATTACTACCGAATTTTAGGACTACCGTTAGCGGCAAGTGAAGAACAATTGCGACAGGCA
TACAG
CGATCGCATTGTACAATTGCCACGACGTGAGTATTCTCAGGCAGCAATTTCTTCTCGTAAACAACATCATAGAAGA
AGCTT
ACGTGGTTTTATCAGATCCAAAACAACGCAGTACCTACGATCAGCTTTATCTTGCCACGCCTATGACCCTGATA
ACCTT
GCTGCTGCCGCGAGTAGCACAGGAAAATCGTACAGAAAGCACAAAAGGGGTAGTGATACCCAGAGTCTTGGTATA
GAAAT
TACCCAAGACGAATTAGTTGGCGCTTTATTAATTTTGCAAGAGTTGGGTGAATACGAACCTGTATTGAACTAGG
TCGTC
CGTACCTAGTAAATAAAAAATAGTGCTACAAGTTCAAGAAAAAGCAATAACTTAGCAGATGAAGAAATTTATGAAA
GTGCT
GAACACCCAGATGTCGTTCTCACTGTTGCTCTTGCTGTCTAGAATTAGGTCGGGAACAGTGGCAGCAAGGTCAC
TACGA
AAATGCCGCCATATCCCTAGAACTGGTCAAGAGCTGCTAGTACGTGAAGGTTTGTCTCCAGTATCCAGGCAGA
AATTC
AGGCTGATCTTTACAAATTGCGGCCATATCGAATTTTGAGTTGCTCGCATTACCTCAAGAAAAGACTGCCGAAC
GAAGC
CAAGGCTTAGAATTATTGCAAAATCTCTTAGAAGATCGTGGCGGGATTGATGGCACGAACAATGATGAATCGGGT
TTAAA
CATAGATGACTTTCTGCGATTTATCCAGCAGTTACGCAACCACTTAACAGTTGCAGAACAGCACAAGTTATTTGA
AGCTC
AAAGCAAACGTTCTTCTGCTGTTGCCACTTACTTAGCTGTTTATGCCTTGATAGCGCGAGGATTTGCTCAACGGC
AACCT
GCTTTAATTCGTCAAGCAAGACAAATGCTCGTGCTCTGGGCAAGCGCCAAGATGTACATTTAGAACAGTCGCTA
TGTGC
CTTACTTTTGGGGCAAACCTGAAGAAGCAACTCGTGTTTTAGAACTTAGTCAGGAGTACGAAGCTTTAGCTTTTAT
TCGGG
AAAAATCTCAGGACTCTCCAGATTTGTTACCGGTCTGTGTTTATATGCAGAACAGTGGCTGCAACACGAAGTCT
TTCCC
CATTTTCGAGATTTAGCAAACAGCAAGCTTTCCTAAAAGATTACTTTGCTAACCAACAGGTGCAAGCTTATTTA
GAAGC
ACTGCCAACTGATGCCCAAACAACATAATGAATGGGCTGTAATTAACCCCCAGTATTTCCCCAGGCCAAGGCAA
GAATA
CTCATTTTCATAACAATTCAACTAAAACCTTCAGCGTCATTTAATCACAGCAGAGTACCTAACCCAGATTTGCCAG
AAACA
CCAACAAAAGAAACCTCTGAATATCCAAACTTCTCACCACCTATGTGGAGTTCATCTGGAAGTATAAAAATCAGAG
GTTCC
TGCTGCTGAAAGGATGAGCAGAGGTACTAATCAGCATTTGAACGGTTCAGCTAAGAGTGCTGCATCTGGTCATAA
CCAAA
AGCGTAGGCGGAGAAAACCTACTCCATCTGCTAGCCGAGAGCGTATACCAGATAATCGTCCTCATTCTCGTCGTC
CCCGA
AGGCGGCGAACTTTTGCGAACACCATAGAAGGTAAAACACGGCTGGTATGGAGAGTGTTTATTTCTTTGGTGAGC
ATATT
AGTTTTTTTGGGTATTAGCCACAACAACCTTTTGATGGTTAAAAAATCTGTTTTTCTCAACCTTCTCCGCCTGA
TCTAC
AGTTGTTTGTACAAATAAACCAACCACCGTTACCTATTCCCCGATCCAAATAGAAAAACCAGAATCAGAAGAAGGCC
CTTTA
ACAAATGCAGAGGCAGAAGAAGTTATTCACACTTGGTTATCTACCAAAGCCGCAGCTTTAGGGCCCAATCATGAG
ATTAA

"Replacement Sheet"

FIG. 8 continued 26/40

TAATTTAGAGCAAATTTTAACTGGTTCAGCTTTATCTCAATGGCGACTGATTGCTCAACAGAATAAGTTAGACAA
TCGCT
ACCGCAAGTTCGACCATAGTTTGAAGATAGAATCTGTTGAGAAAATTGGTTTATTTGCAGATCGTGCCGCAGTAG
AAGCT
ACGGTCAAAGAAGTGACGCAGTTATATGAAAATAATCAGTTTAAAACTCTTCTAACGATAAATTAAGAGTTCGG
TATGA
CTTGATTGAGAACGAGGTAAATGGCGTATTGAGAGTACATCTGTTGTAAATCAATTCACCAGATAA

PROTEIN (SEQ ID NO:167):

VRIPLDYYRILGLPLAASEEQLRQAYSDRIVQLPRREYSQAAISSRKQLIEEAYVVLSDPKQRSTYDQLYLAHAY
DPDNL
AAAAVAQENRTESTKRGSDTQSLGIEITQDELVGALLILQELGEYELVLKLGRPYLVNKN SATSSRKSNLADEE
IYESA
EHPDVVLTVALACLELGREQWQGHYENAAISLETGQELLVREGLFSSIQAEIQADLYKLRPYRILELLALPQEK
TAERS
QGLELLQNLLDRGGIDGTNNDESGLNIDDFLRFIQQLRNHLTVAEQHKLFEAQSKRSSAVATYLA VYALIARGF
AQRQP
ALIRQARQMLVRLGKRQDVHLEQSLCALLLGQTEEATRVLELSQEYEALAFIREKSQDSPDLLPGLCLYAEQWLQ
HEVFP
HFRDLANQQAFLKDYFANQQVQAYLEALPTDAQTTNEWAVINPQYFPQAKAKNTHFHNNSTKTSASFNHSRVPNP
DLPET
PTKETSEYPNFSPPMWSSSGSIKSEVPAAERMSRGTNQHLNGSAKSAASGHNQKRRRRKPTPSASRERIPDNRPH
SRRPR
RRRTFANTIEGKTRLVWRVFISLVSILVFWVLATTTFGWLKNLFFPQSPDDLQLFVQINQPPLPIPDNRKPES
EEGPL
TNAEAEVVIHTWLSTKAAALGPNHEINNLEQILTGSALSQWRLIAQQNKLDNRYRKFDHSLKIESVEKIGLFADR
AAVEA
TVKEVTQLYENNQFKNSSNDKLRVRYDLIRERGKWRIQSTSVVNQFTR*

"Replacement Sheet"

FIG. 8 continued 27/40

>*Synechocystis* sp. strain PCC6803 D63999:2314780-2316924 (SEQ ID NO:168):
GTGTTTATCCCCCTCGACTTTTATCGTATTTTAGGCATTCTCCCCAGAGTGGTGGGGAA
ACCATTTAGCAGGCCTACCAAGATCGCCTTTTACAATTACCCCGGCGAGAATTTAGTGAC
GCCGCAGTTACTCTCCGCAATCAATTACTGGCGATCGCCTATGAAACCCTGAGGGATCCG
GAAAAACGTCAGGCATACGACCAAGAATGGTGGGGAGCCATGGATGAAGCCCTGGGGGAG
GCCTTACCCCTCACTACCCCGGAGTTGGAATGTAGCCCAGAGCAAGAAATTGGAGCCCTG
TTGATCCTGTTGGATTTGGGGGAATACGAACTCGTGGTTAAGTATGGTGAGCCAGTACTC
CACGATCCCAACCCTCCGGCGGGAGGCCTGCCCCAGGACTATTTGCTTTCGGTAATTTTG
GCCCCACTGGGAACCTGAGCCGGGAACGTTGGCAACAACAGCAGTATGAATTTGCCGCCACC
GCCAGTCTTAAGGCCCTAGCTCGGTTGCAACAGGATAATGACTTCCCCGCCTTGGAAGCA
GAAATTCGTCAGGAACCTATACCGTCTGCGACCCTACCGTATCCTCGAATTTTGGCTAAG
GAGGGGCAAGGGGAGGAGCAACGTCAGCAGGGTCTAGCTCTGTTGCAAGCGATGGTGCGAG
GACCGGGGCGGCATTGAAGGTAAGGGGGAAGATTATTCCGGATTGGGAAATGATGACTTT
CTAAAATTCATCCACCAACTACGCTGTACCTCACAGTGGCCGAGCAAAACGCCCTATTT
TTGCCCGAAAGTCAACGGCCATCTTTAGTAGCAAGCTATTTGGCAGTACATAGTCTGATG
GCTGAGGGGAGTGAAGGAACAGGACCCCTATGGCCATTGTCTGAAGCAAAATCTTTGATTATA
CAGTTGGAAAATTGTCAAGATTTGGCCCTAGAAAAGGTAATTTGTGAATTATTATTGGGT
CAAACGGAAGTTGTTCTGGCGGCGATCGACCAGGGAGATCCGAAAATAGTAGCTGGCCTC
GAATCTAAGTTAGCGACGGGGGAAGACCCCTTAAGTCTTTTTATACTTTCACTGAGCAG
TGGCTAGAGGAAGAAATTGTCCCTACTTTAGGGATCTTTCTCCGGAGACCCTTTCCCCC
AAGGCCTATTTCAATAATCCCTCCGTTTCCGAGTATCTAGAACAACCTAGAGCCGGATTCC
TTCACCACTGACAATTTCTTTTGCCTCCCCTGCCCTCCTTAGCACCGCAACGGAATCGGAA
ACTCCCATGGTACATAGTTCCGCCGCCCTTCCCGATCGCCCTTTGACCTCCACCGTTCCC
TCACGACGGGGACGCAGTCCAAGACGTTCCCGAGACGATGTTTTCCCCAGCGCCGACAAT
TCCAGTGGTTTTGGCCGTCAACACCCTATCTCCGGCGATCGCCTACGACACCCACTCCTTG
GGCACCACCGGTATTGGCGGGGATAGCACTAGCAACGGTTTTTCCAGTAACCTCCGCCCCA
GAATCCACCAGTAAACATAAATCTCCCCGGCGACGCAAAAAACGGGTGACCATCAAGCCG
GTGCGCTTCGGCATTCTTTCTGCTTTGCCTAGCAGGCATTGTGGGGGGGGCAACTGCCCTA
ATTATCAATCGTACTGGCGATCCCCTAGGTGGGTTGCTAGAAGACCCCTAGATGTTTTTC
CTGGACCAACCTTCAGAATTTATCCCCGATGAAGCCACGAGCCGGAATTTGATTCTCAGT
CAACCCAACCTTCAATCAGCAAGTGGGTGAGTACAGGCTGGCTTGATAGTAAA
AAGCTTGCCTTTGGCCAAAACACGATGTGCGGGCATTGCAGAGTGTGTTTAGCCCCCAAT
CTCCTTGCCCCAACACGGGGTCTGGGCCAACGGGATCAAGCCCCAAAAGGTCTATACCAA
TACGAACACAAGTTGCAGATTTTAGCCTATCAAGTTAACCCCCAAGACCCCAACCGAGCC
ACCGTTACTGCCCCGGGTAGAAGAAATTAGCCAGCCCTTTACCCTAGGTAATCAACAGCAG
AAGGGCTCCGCCACCAAGATGACTTGACTGTGCGCTATCAGCTAGTACGACACCAAGGG
GTTTGGAATAATTGACCAAATACAAGTGGTAAATGGCCCCCGTTAG

NP_441990 (SEQ ID NO:169):

1	mfipldfyri	lgippqsgge	tieqayqdr1	lqlprrefsd	aavtlrnqll	aiayetlrdp
61	ekrqaydqew	wgamdealge	alplttpele	cspeqeigal	lilldlgeye	lvvkygepvl
121	hdpnppaggl	pqdyllsvil	ahwelsrerw	qqqqyefaat	aslkalarlq	qdndfpalea
181	eirqelyrlr	pyrilellak	egqgeeqrq	glallqamvq	drggiegkge	dysglgnddf
241	lkfihqlrch	ltvaeqnalf	lpesqrpslv	asylavhslm	aegvkeqdp	aiveakslil
301	qlencqdlal	ekvicelllg	qtevvlaid	qgdpkivagl	eskatgedp	ltafyftfeg
361	wleeeivpyf	rdlspetlsp	kayfnnpvsq	qyleqlepds	fttdnsfasp	allstatese
421	tpmvhssaal	pdrpltstvp	srrgrsprrs	rddvfpsadn	srglavttls	paiaaydthsl
481	gtngiggdst	sngfssnsap	estskhkspr	rrkkrvtikp	vrfgillcl	agivggatal
541	iinrtgdplg	glledpldvf	ldqpsefipd	eatsrnlils	qpfnfqvgvq	mvvqgwldsk
601	klafgqnydv	galqsvlapn	llaqqrgraq	rdqaqkvvhq	yehklqilay	qvnppdpnra
661	tvtarveeis	qpftlgnqqq	kgsatkddlt	vryqlvrhqq	vwkidqiqvv	ngpr

BAA10060 (SEQ ID NO:170):

"Replacement Sheet"

FIG. 8 continued 28/40

1 mfipldfyri lgippqsgge tieqayqdr1 lqlprrefsd aavtlrnqll aiayetlr dp
61 ekrqaydqew wgamdealge alplttpele cspeqeigal lilldlgeye lvvkygepvl
121 hdpnppaggl pqdyllsvil ahwelsrerw qqqqyefaas askalarlq qdndfpalea
181 eirgelyrlr pyrilellak egggeeqrqq glallqamvq drggiegkge dysglgnddf
241 lkfiqhrlrch ltvaeqnalf lpesqrpslv asylavhslm aegvkeqdpm aiveakslii
301 qlencqdlal ekvicelllg qtevvlaaid qgdpkivagl esklatgedp ltayftfteq
361 wleeeivpyf rdlsptlsp kayfnnpsvq qyleqlepds fttDNSfasp allstatese
421 tpmvhssaal pdrpltstvp srrgrsprs rddvfpsadn ssglavttls paiaydthsl
481 gtngiggdst sngfssnsap estskhksprr rrrkrvtikp vrfgifllcl agivggatal
541 iinrtgdplg glledpldvf ldqpsfipd eatsrnlils qpfnfqvggq mvvggwldsk
601 klafgqnydv galqsvlapn llaqqrgraq rdgaqkvvhq yehklqilay qvnpqdpnra
661 tvtarveeis qpftlgnqqq kgsatkddlt vryqlvrhqq vwkidqiqvv ngpr

AY074283 (SEQ ID NO:171):

MPVAYTFPVLPSCLCGISNRSTSFVVDRLPELQISGLLVVRSE

SGEFFGSGLSLRRFQREGRRRLNAAGGGIHVVDNAPSRTSSSLAASTSTIELPVTCTYQL

IGVSEQAEKDEVVKSVINLKKTDAAEGYTMEAAAAARQDLLMDVRDKLLFESEYAGNLK

EKIAPKSPLRIPWAWLPGALCCLLQEVGQEKLVLDIGRAALRNLDSPYIHDIFLSMAL

AECAIAKAAFEVNKVSQGFALARAQSFLKSKVTLGKLALLTQIEESLEGLAPPCTLD

LLGLPRTPENAEERRRGAIALRELLRQGLSVEASCQIQDWPCFLSQAISRLATEIVD

LLPWDDLAI TRKNKKSLESHNQRVIDFNC FYMVLLGHIAVGFSGKQNETINKAKTIC

ECLIASSEGVDLKFEFAFCSFLLKQGSAAEALQKQLESNSDSAVRNSILGKESRSTS

ATPSLEAWLMESVLNFPDTRGCSPSLANFFRAEKKYPENKKMGSPSIMNHKTNRPL

STTQFVNSSQHLYTAVEQLTPTDLQSPVVS AKNNDTSASMPVQLKRNLGVHKNKIW

DEWLSQSSLI GRVSVVALLGCTVFFSLKLSGIRSGRLQSMPI SVSARPHSESDSFLWK

TESGNFRKNLDSVNRNGIVGNIKVLIDMLKMHCGEHPDALYKSSGQSATSLSHSASE

LHKRPMDTEEAELVRQWENVKAEALGPTHQVYSLSEVLDESMLVQWQTLAQTAEAKS

CYWRFLVLLHLEVLQAHIFEDGIAGEAAEIEALLEAAELVDESQPKNAKYYSTYKIRY

ILKKQEDGLWKFCQSDIQIQK"

At3g19180 (SEQ ID NO:172):

1 actgtcaaaa ctcaaaagcc ttgagaccaa atttccgatt ttttctctc tgaagaaatc
61 caacaaattg taccatgatt ccagcttcac tctacttctt ctaggggttcg ttcggtttct
121 ggagctgttg cgcaatgccg gttagcttaca catttccagt tctcccttct tcttgtctgc
181 tttgcggaat ctccaatcgc agcaccagct tcgctcgtaga tcgcccggag cttcagatct
241 caggtctcct cgtcgttcgt tctgaatccg gtgaattctt cgggttctgg tttatctttgc
301 ggcggtttca gcgagaagga cggaggaggt tgaatgctgc tgggtggtgg atccatgctg
361 tcgacaatgc gccgtctcgt acttcttctc tcgctgcata tacctctaca atcgaactcc

"Replacement Sheet"

FIG. 8 continued 29/40

421	cggttacgtg	ttaccagctt	atcggagttt	ctgagcaagc	tgagaaagac	gaggtcgtta
481	agtcggttat	aaatttgaaa	aaaactgatg	ctgaagaggg	ttatacaatg	gaagctgctg
541	cagctcgcca	ggatcttctc	atggatgtta	gggataaaact	tctttttgaa	tcagaatatg
601	ctggtaacct	aaaagaaaag	attgctccta	aatctctctc	cagaattccg	tgggcatggg
661	tgcctgggtg	tctatgcctt	cttcaagagg	ttggacaaga	aaaactttgt	ctggatattg
721	gccgggctgc	tctcaggaac	cttgattcaa	agccatatat	tcatgatata	ttcttatcta
781	tggcacttgc	tgagtgtgca	attgccaaag	ctgctttcga	ggttaacaag	gtctctcaag
841	gatttgaaag	tcttgctcgt	gctcaaagtt	ttctgaagag	taaagttact	cttgggaaac
901	ttgcattgtt	aactcagatt	gaggagtcac	tagaggggct	tgcaccacct	tgcacattgg
961	atctactggg	cctgccacgc	acgccagaaa	atgcagagag	gaggcgaggt	gcaattgccg
1021	cgctacgcga	actgctcaga	cagggcctta	gtgttgaagc	ttcatgtcaa	attcaagact
1081	ggccatgctt	tttgagccag	gcaattagca	ggttattggc	cacagagatt	gtcgatcttc
1141	ttccatggga	tgatttagcc	attacacgga	aaaataaaaa	atcactggaa	tcccacaatc
1201	aaagagttgt	tattgatttt	aattgtttct	acatgggtgt	acttggtcac	atcgctgttg
1261	gattttcagg	caagcaaaat	gaaacgatta	ataaagcaaa	aacgatatgc	gaatgtctca
1321	tagcatcaga	aggtgttgat	ctgaaatttg	aggaagcttt	ttgctcattt	cttctaaaac
1381	agggttccga	ggcagaggcc	ctggaaaaac	ttaagcagct	ggaatcaaat	tcagactctg
1441	ccgttcgtaa	ttcgatcttg	gggaaagagt	cgagaagtac	ttctgctact	ccctcactgg
1501	aagcgtggct	aatggagtcc	gtgcttgcta	actttccaga	cacaaggggt	tgttctccat
1561	ctttggccaa	ttttttccgg	gctgaaaaga	aatatccaga	aaacaagaaa	atggggtcac
1621	cttcgatcat	gaatcataag	acgaaccaa	gaccactttc	cacaacacag	ttcgtgaact
1681	cgtcacaaca	tctttataca	gctgtcgagc	agttgacacc	aacagatttg	cagagcccag
1741	tggatatcag	caagaataat	gatgaaacca	gtgccagtat	gccatctgtt	caactgaaga
1801	ggaaccttgg	tgtacacaaa	aataaaatat	gggatgagtg	gctctctcaa	agcagtttga
1861	tcggaagggt	atctgttggt	gctttactgg	gttgccaccg	gttcttctct	ctgaagctat
1921	caggcattag	gtctggtaga	ctacagagta	tgcctatatc	ggtttctgct	aggccgcatt
1981	cagaatcaga	ttcttttctg	tggaaaacag	agtctgggaa	tttcagaaaa	aaccttgatt
2041	ctgtgaatag	aaatggatat	gtgggaaaca	tcaaagtgtc	cattgacatg	ttaaagatgc
2101	attgtggcga	acatccggat	gccctgtatc	tgaaaagctc	tggatcaatc	gctacatcat
2161	tgtctcattc	tgcgtcagaa	ctgcataaga	gaccaatgga	tacagaagaa	gcggaagagc
2221	ttgtgagaca	gtgggaaaat	gttaaggctg	aagctcttgg	accaacacat	caagtttata
2281	gcctttccga	agtccttgat	gaatccatgc	ttgtccagtg	gcaaacattg	gcacaaacag
2341	cagaggcgaa	atcctgttat	tggaggttcg	ttctgcttca	tcttgagggt	ttgcaagcac
2401	atatattcga	agatgggtat	gctgggtgagg	ctgcagaaat	cgaagctctt	ctggaggaag
2461	cagcagaatt	agttgatgaa	tctcagccca	aaaacgcaaa	atattatagc	acttacaaga
2521	tccgatatat	tctgaagaag	caagaagatg	gattgtggaa	attctgccaa	agcgatatct
2581	aaatacagaa	gtgaaaatcc	cccagaaaaa	aaagctcatc	atctaactaa	aggttgtagc
2641	atcaacagta	gaacatggga	tcatttagct	aacggttgtt	cttgtttacc	taacgggtgta
2701	ggaaagtctc	aggtttgttt	ctttattcct	tagtaaccca	caggatttgt	ctttgtagat
2761	tcttttgatt	tcaatgtgtt	tatggataaa	caaacttctt	gagtattttt	tttattatta
2821	ttgtaaagcg	ttactgatca	caaaaaaaaa	aaaaaaa		

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"Replacement Sheet"

FIG. 8 continued 30/40

AAL66980 (SEQ ID NO:173):

```
1 mpvaytftpvl pssc1lcgis nrstsfvvdv pelqisgllv vrsesgeffg sgls1rrfqr
61 egrrrlnaag ggihvvdnap srtsslaast stielptvcy qligvseqae kdevvksvin
121 lkktdaeegy tmeaaaaarqd llmdvrckll feseyagnlk ekiapksplr ipwawlpgal
181 cllqevggek lvldigraal rnldskpyih diflsmalae caiakaafev nkvsqgfeal
241 araqsf1kksk vtlgklallt qieeslegla ppctldllgl prtpenaerr rgaiiaalrel
301 lrqglsveas cqi1dwp1fl sqaisrllat eivdllpwdd laitrknkks leshnqrvvi
361 dfncfymvll ghiavgfsgk qnetinkakt icecliaseg vdlkfeeafc sfl1kqgsea
421 ealeklkqle snsdsavrn1 ilgkesrsts atpsleawlm esvlanfpdt rgcspslanf
481 fraekkypen kkmgspsimn hkt1nqrplst tqfvnssqhl ytaveqltpt dlqspvvsak
541 nndetsasmp svqlkrnlgv hknkiwdewl sqssligrvs vvallgctvf fslklsgirs
601 grlqsm1p1sv sarphsesds flwktesgnf rknldsvnrn givgnikvli dmlkmh1cgeh
661 pdaly1kssg qsatslshsa selhkrpmdt eeaeelvrqw envkaealgp thqvyslsev
721 ldesmlvqwq tlaqtaeaks cywrfvllhl evlqahifed giageaaeie alleeaaelv
781 desqpknaky ystykiryl kkqedglw1f cqsdiqiqk
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"Replacement Sheet"

FIG. 8 continued 31/40

Second Set

BJ258222 (SEQ ID NO:174):

GGCCGTCGGCAAATACTGCAGNTTGCACATGATACTCTCACAAACCAGAGCTCCCGCACC
GAGTATGACCGCGCGCTCTCTGAGGACCGTGACGCGGCGCTCACACTGGATGTTGCTTGG
GACAAGGTTCCGGGTGTGCTATGTGCCCTTCAGGAGGCTGGGGAGGCACAGGCAGTGCCTT
GCAATTGGAGAGCACCTTACTGGAGGACCGCCCGCCCAAGCGGTTCAAGCAGGATGTGGTG
CTGGCAATGGCGCTCGCTTATGTGGACATATCAAGGGATGCAATGGCGGCTAGCCCTCCA
GATGTAATCCGCTGCTGTGAGGTGCTTGAAAGGGCTCTCAAGCTCTTGCAGGAGGATGGG
GCAATCAACCTTGCACCTGGTCTGCTTTCACAAATTGATGAAACTCTGGAGGAGATCACA
CCTCGTTGTGTTTTGGAGCTTCTTGCCCTTNCTCTTGATGAAAAACATCANATTGAACGC
CANNAANGNNT

BQ410206 (SEQ ID NO:175):

AATTGCAGAAGGCATTGTTTCGCAAGTGGCAGAACATTAAATCTGAGGCGTTTGGACCTGA
TCACCGCCTTGATAAATTGCCAGAGGTTCTGGATGGTCAAATGTTGAAGACATGGACAGA
TCGTGCAGCCGAAATCGCTCAGCTTGGTTGGGTATATGAATATAGTCTACTGAACATGGC
CATTGACAGTGTTACCCCTTTCCTAGATGGCCAGCGAGCTGTAGTCGAAGCTACTCTGGA
AGAATCCACCTGCTTGACTGATGTTTCATCATCCGGAGAACAATGCCTCTAATGTAAACTC
CTACACCACGAGATATGAGATGTCTTGTTCCAACCTCAGGCTGGAAAATCACTGAAGGATC
TGTCTACAAATCTTAACTATGATGTATAAAGCATAAAAAGCCTGAAAGCTCCAATGTGGT
TACCAGCTTTGCCTTTTTTACGTAGCTATATTTGTTATATTGTTTGAGAAAACAAGAGTTA
GCGTTTTCCAGTCATGCAAGCAGTTCAAATTAAAAGAGGCAATGCTTNTCATGGANAACN
AAATG

"Replacement Sheet"

FIG. 8 continued 32/40

AJ485537 (SEQ ID NO:176):

GATGAGCCCATACAGATTCCTAAATGGATGCGAAGCTGGCAGAAGATATTGTTTCGCAAG
TGGCAGAGCATCAAATCCAAGGCCTTGGGATCAGATCATTCTGTTGCATCATTGCAAGAG
GTTCTTGATGGCAACATGCTGAAGGTATGGACAGACCGAGCAGCAGAGATTGAGCGCAAA
GGCTGGTTCTGGGACTACACGCTGTTCAACGTGGCGATCGACAGCATCACCGTCTCCCTG
GACGGACGGCGGGCGACCGTGGAGGCGACAATTGAGGAGGCGGGTCAGCTCACCGACGCA
ACCGACCCAGGAACGATGATTTGTACGACACTAAGTACACCACCCGGTACGAGATGGCC
TTCACCGGACCAGGAGGGTGGAAGATAACCGAAGGCGCAGTCCTCAAGTCGTCATAGGGC

BJ263824 (SEQ ID NO:177):

CTGCAAATCTAGCACTATGTTTCTCTTTATCTCCAGGATCTAGCCTAGCACCAACAATCC
AAATACAACACAAGAAAAATAAAGCTCTTCGTGATCACATCAGACTAACGCAACTATCG
GTCTTCCAACTAAAAAGGGCCTAGACTGCCTGCTTATTTACACACCCCCAAAAGAAAAC
TGGAAGGAATTAACAAACTTAATGAGGTTACCGCACACCAACTACCCTAAGACGACTTGA
GGACCGCGCCTTCCATTATCTTCCACCCTCCTAGTCCGGTGAAGGTCATCTCATACCGGG
TGGTGTA CTTCGTGTCGTACGAGTCGTGTTCTTGGGGTCGGTTGCGTCGATGAGCTGGC
CTGCCTCCTCGATCGTTGCCTCCACGGTCGCCCCCGTCCGTCCAGGGAGACCGTGATGC
TGTCGATCGCCACGTCAGACAGTGTGTAGTCCCAGAACCAGCCTTTGCGCCCGATCTCCG
CTGCTCGGTCCGTCCATACCTTCAGCATGTTGCCATCAAGAACCTCTTGCAATGATTCCA
CAGAATGATCTGATCCCAAGGCCTTGGTTTTGATACTCTGCCACTTGCGAACAATATCTT
CTGCCA

BQ410207 (SEQ ID NO:178):

TTTAACTTGCCTCTTTTAATTTGAA
CTGCTTGCCTGACTGGAAAACCCCTAACTCTTGTTTTCTCAAACAATTTAACAAATATAGC
TCCCTAAAAAGGCAAAGCTGGTAACCACATTGGAGCTTTTTCAGGCTTTTATGCTTTATAC
ATCATAGTTAAATTTGTAGACAGATCCTTCAGTGATTTTCCAACCTGAGTTGGAACAAA
ACATCTCATATTTTCGTGGGGTAGGAGTTTACATTACAGGCATTGTTCTCCGGATGATGAA
CATTACTCAAGCCGGGGGGTCTTCCAAAATAACTTCGACTACAGCTCGCTGGCCATTTA

"Replacement Sheet"

FIG. 8 continued 33/40

ATGAAAGGGTAACACTGTCAATGGCCCTGTTTCAGTCAACTTTATTCATATACCCAACCCA
GCTGACCGATTTTCGGCTGCACCAACTGTCCATGTTTTCAACATTTGACCATCCAAAACCT
TTGGCAATTTATCAAGGGGGGGATCAAGTCCAAACGCCCTCAGATTTAATGTTCTGCCACT
TGCGAACAATGCCTTTTGCAATT

AJ485539 (SEQ ID NO:179):

GATGAGCCCATACAGATTCCTAAAATGGATGCGAAGCTGGCAGAAGATATTGTTTCGCAAG
TGGCAGAGCATCAAATCCAAGGCCCTTGGGATCAGATCATTCTGTTGCATCATTTGCAAGAG
GTTCTTGATGGCAACATGCTGAAGGTATGGACAGACCGAGCAGCAGAGATTGAGCGCAAA
GGCTGGTTCTGGGACTACACGCTGTTCAACGTGGCGATCGACAGCATCACCGTCTCCCTG
GACGGACGGCGGGCGACCGTGGAGGCGACAATTGAGGAGGCGGGTCAGCTCACCGACGCA
ACCGACCCCGAGGAACGATGATTTGTACGACACTAAGTACACCACCCGGTACGAGATGGCC

AJ463103 (SEQ ID NO:180):

TGATGGCAACATGCTGAAGGTATGGACAGACCGAGCAGCAGAGATTGAGCGCAAAGGCTG
GTTCTGGGACTACACGCTGTTCAACGTGGCGATCGACAGCATCACCGTCTCCCTGGACGG
ACGGCGGGCGACCGTGGAGGCGACAATTGAGGAGGCGGGTCAGCTCACCGACGCAACCGA
CCCCAGGAACGATGATTTGTACGACACTAAGTACACCACCCGGTACGAGATGGCCTTCAC
CGGACCAGGAGGGTGGAAAGATAACCGAAGGCGCAGTCCTCAAGTCGTCATAGGGCGTTCA

BQ169059 (SEQ ID NO:181):

TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTCAGCGGCAAATTCAGCACTATGTTTCTCTTAT
CCCCAACTCAAAGATCTTCTAAGCTAGCAATAATCCGAAAACGACACAGGGAAAAACAAA
GCTCATCGCTGATTGCACATCAGACTAACCAAACTATCTCCAACCTCCAAACTGAGAAGG
GCCTAGACTGCTTATTTACACACCAAAAAGAACACGGGAGGAATCAATCAACAAAGGTCT
ACTGCACACCGAACGCCCTATGACGACTTGAGGACCGCACCTTCTGTTATCTTCCACCCCT
CCTGGTCCAGTGAAGGTCATCTCGTACCGGGTGGTGTACTTAGTGTCGTACAAATCGTTG
TTCTTGGGGTCGGTTGCATCGGTAAGCTGGCCTGCCTCCTCAATTGTCGCCTCCACAGTC
GCCCCGTCGTCCGTCCAGGGAGACGGTGATGCTGTCAATCGCCACGTCGGACAGCGTGTAG

"Replacement Sheet"

FIG. 8 continued 34/40

TCCCAGAACCAGCCTTTGCGCTCGATCTCTGCTGCTCGGTCCCTCCATACCTTCAGCATG
TTGCCATCA

BJ482132 (SEQ ID NO:182):

GCGAGNAAGGACGAGNATCGTCAAGTCGGCCATCGAGCTGAGGAAATCGGAGATCGAAGA
TGGGTACACGGAGGAGGTGTCCACCTGCAGACAGGCTCTGCTGCTGGACGTGAGAGACAA
GCTTCTCTTTGAACAGGAGTACGCAGGAAGCACCAGGGCCAAGGTTCCGCCCAGATCCTC
TCTTCATATACCCTGGAGCTGGTTGCCTGCTGCCTTGTGTGTCTTGCAGGAGGTTGGGGA
AGAGAAGCTGGTCTTGGACATTGGTCAGGCAGCTCTACGACGCCCTGATTCTAAGCCATA
TGCTCACGATGTACTTCTTGCAATGGCACTAGCTGAATGCTCCATTGCAAAGCTAGCTT
TGAAAAAGTAAAGTATCTCTTGGCTTTGAGGCTCTAGCACGTGCTCAATATCTTTTGAG
GAAAAACCATCTTTAGAGAAGATGCCTCTTCTTGGAGCAGATCGAAGAATCACTTGAAGA
GCTTGCACCAGCTTGCACCTCTAGAGGTTTAAAGCCTGCCCCGTACACCTGAAAATTCTGA
ACGCAGGCGTGGTGCTATTGCAGCTCTCTGTGA

BQ490457 (SEQ ID NO:183):

GCATAACACGGCAAGAAGATGTTGCAGTTAATGGCTTTGGAAATGAGGATGTTACAATGG
AGCTTGGCCGTGATAACACTTTAGATTATGTGAATTTAGCCAGTTCAAATTTTACTGAAG
ATAATATCGAGCAAGAATCGGTTACTGAGAAGATAAAAGATTTAGGTGTGAAGGTTATGT
GTGCCGGTGTGGTGATTGGACTGACAACCTTTGGCTGGCATGAACTTTTGCCTGGCAGAA
GTGGGTCTGCCATTCCACACAGGCATCTTGGTTCTGCTGTGGCTTCTGATGTCTCCAGTG
TGGGGCTCTCAGTAAATGAACTACTGAGGAGAAAGTACCAAAAATGGATGCAAGACTTG
CAGAAGTTCTAGTTAGAAGATGGCAGAACGTTAAATCACA

BU046755 (SEQ ID NO:184):

1	gcagttgcaa	ttgctggggg	ngattcacta	cgtgaaaatt	tcatgaacga	ggccttcttg
61	catatgactg	cagctgagca	ggttgattta	ttttagtagta	ccccagtaa	tatcccggca
121	gaaagctttg	aagtttatgg	ggtggctctt	gcgcttggtg	ctcaagcctt	tgttggtaaa
181	aaacctcatc	acattcaaga	tgctgaaaac	ctattccaga	aacttcagca	gtctaaggta
241	acagctgtag	gacattctct	tgacaactat	ataaccaaag	aaagcagtga	gatagacttt
301	gctttggaga	ggggactctg	ttcacttctt	ctaggggacc	ttgatgacag	tcgttcgtgg
361	ttgggcctag	acagtaatga	ttcaccatat	agaaatccat	ctggtgtaga	ctttgtcttg
421	gagaactcaa	aggatgacga	tgacaatgac	aatgacaatg	atcttcctgg	actttgcaag
481	ctattggaga	cgtgggtgat	ggaggtggta	ttccccaggt	ttagagacac	caaagacata
541	gagttcagac	tgggagacta	ctatgatgat	cctacagtct	tgagatactt	agaaaggctg
601	gatggcacta	atggttcacc	cttagctgct	g		

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"Replacement Sheet"

FIG. 8 continued 35/40

BU035730 (SEQ ID NO:185):

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1  cagaaagagg tggctggatt gatgactttg gctggccttga aatttatacc gtcttaaaca
61 ggctctacta gtactactgc tcgtaaagaa gttgattcgg ctctggcttc agacgtcacc
121 aatgtggagg attctagggg tgaggatgct gaagacattc ctaaaatgga tgcaagatta
181 gccgaagggtc tagttcgtaa gtggcagagc ataaaatccc aagcccttgg acctgagcat
241 tgccactcaa aattatcata ggtattagat ggtgaaatgc acaagatctg gcttcaacgg
301 gcaaccgaaa ttgctcaacg tggttggttt tgggactaca cgcttttaaa cattaccatt
361 gacagtgtta ccgtttcact cgatgggagc ttagctgttg tggaagcaac cttgaagag
421 tctgccaaagt tgattgattt gacccacccg gaaaacaatg actcctataa tttaacttac
481 accacacgtt atgagatgtc gtgtgccaaag tcatcatgga aaatcacaaa gggggctgtc
541 ctcaaactat aacagatgta attctttctc accttttctg tatttatctg ttattagatt
601 actcagcagt tgaatgatat gtttctccac catttcgatc atgagcg
```

BQ977057 (SEQ ID NO:186):

```
1  tgtggtgggtt ggattgatga ctttggctgg cttgaaattt acaccgtcca aaagaggctc
61 tactagtact actgctcgta aagaagttga ttcggctctg gcttcagacg tcaccaatag
121 gattctaggg ttgaggatgc tgaagacatt cctaaaatgg atgcaagatt agccgagggg
181 ctagtctgta agtggcagag cataaaatcc caagcccttg gacctgagca ttgccactca
241 aaattatcag aggtattaga tggtgaaatg cacaagatct ggcttcaacg ggcaaccgaa
301 attgctcaac gtggttggtt ttgggactac acgcttttaa acattaccat tgacagtgtt
361 accgtctcac tcgatgggag cttagctgtt gtggaagcaa cccttgaaga gtctgccaa
421 ttgattgatt tgacccaccc ggaaaacaat gactcctata atttaactta caccacacgt
481 tatgagatgt cgtgtgccaa gtcttcatgg aaaatcacaa agggggctgt cctcaaacta
541 taacagatgt aattctttct caccttttct gtatttaact gttattagat tactcagcag
601 ttgaatgata tgtttctcca ccatatcgat catgagtgtt tttgggtgctg cc
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BU889000 (SEQ ID NO:187):

```
1  gactgaaaaa ataaaagatg ccagtatcaa aatatgtgtg ctggtgtggc aattggactg
61 ctgacttttag ctggcctgaa gtgttttctt cctaggactg gtccttcat tcgacagaaa
121 gaaattgggtt cggcaatggc atctgacacc atcaatttga attcagcagt agatgaacaa
181 atttccgagg acttaccagc aatggatgca aggggtgcag aggatatagt tcgcaagtgg
241 caaaacatta aatctcaggc ttttggaact gatcactgcc tggcaaaatt gccagagggt
301 ttggatagtc agatgttgaa aatatggaca gatcgtgcgg ccgaaattgc acatcttgg
361 tgggtatacg agtatatgct gttggacctg actattgaca gtgtgactgt atctgtagat
421 ggcctaaatg ctgtagtaga agcaacactc aaagagtcaa
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"Replacement Sheet"

FIG. 8 continued 36/40

>genie.294.6|Genomic (SEQ ID NO:188):
ATGAACTCGGCGGAGCACGTCTCTGTTGCCGTGGACTATTACCGAATGCTGCACGTTCCCCGCGTAAGCC
GCCCTGACGCCATTTCGCAAGGCGTATGAGAACCTGGTGAAGCAACCCCCCGCTGCCGCGTACTCTGCGGA
CACCCCTCTTCGCACGCGCGGTGCTACTCAAGGCAGCCGCGGAGTCGCTGACCGACCCGGACCTGCGCCGC
TCATATGACGCCAAGCTGGCCGCTGGTCACACAGCCCTGCGCGTCAGCCAGCAGGACCTACCCGGAGCCC
TTGTCGTGCTGCAGGAGGTGAGCCGTGCTCTGGCGACCGCTCAACCCCTTGCGACCGCTAAACCATCAG
CACATATAGCACATATAAATTCCCATGGGTTCTGTACTACCGCCACCCCTCTGAAGGGGGCGAGTATTC
ATTCTTCACGCATGAGCGCAGACTTTTACCCATCAAGTCCCGCCCTCGCCCGCCTTCTCTTCCACAGA
TCGGCGAGCACCAGTTGGTTCTGGATCTGGGTCTGCGCTGGCTAGAGGTAAACGGCGGCCAGCCCGACGC
CGGCGACGTGGCCGCTGCCGTGGCCCTGGCTACTGTGACCGCGCTGGTGAGCGCCTCACCTCCAGCTG
CAGCCGCGCCGCGCTCAGCGCTGCCAGGCCCGATGGCGCGCGGTGCCGCACGCGCAGTGCGCGCGG
TGCTGCCCCGATGCGACGACCTGGACGCGAGCTGAGCAAGCTCCGCGCGTACGGCATGGCGCAGCAGCT
GCAGCAGCAGATCGTGGGCGCGCTGCGGGTGAGGCTGGAGCAGGGGCTGGACCGGCAACCGGTCATAGAT
GTAGACACAGGGATGTAGGCGTCGATGCGAGGGGATGGAAGTATGGGGTCTGTGAGTGTGAGCCGATGG
AAGGTATAGATGCTGGGAGCTGGCGCACCCGACCCATGTTCATCCAAGGACTTGGCTGATGCATCGCTCAC
CCCCCGCCTCCAACCCGAATGCCCTCAGGACCTGGCGCCAGAGTACGCGTGCGAGCTGGCCGCCCTGCCG
CTGGGCGCCGAGACCGCCGCCCGCGCGCAAGGGCGTGCGCTCATGCGCGGTGTGCTGCGCGCCGCCG
CCACCGTGCCCGCCGCCACAGCCAAGTAGGTGACAAGCACGCAGGAAATCGTGTGCTATATTGCATTGCG
GTACCTTGCTTGCATCGCGGAGGCAGTGCTCGAGAATGCGTTTCGTGCGCGTGATCCGTTTGCTCGTCG
TGCCTTATCCGCCACCCAGGCCGAGGCTGCTGCTGACGACAGCGACGACGAGGTGGACCCGCGCA
GTGTGCTGGCGCGCCGCCCGCGCATGCTGACCCGACGCGCGACGTGCTCACCTGCAGCGAGCAGGTACA
GCGCTGCAACCGGCAGTTATAGATGGATGCAAGTGCGTGACGCCGAACGTACAGTTTTTGCTGTGTTTC
CCGCGTGACACCTTAGCCGCTCCTCCTGCAACCCCTCACTTGCGACCTCAATGCGTGACACCTTAGCCGCTC
CTCCTGCAACCCCTCAGTTTGCAGCTCACGACACACCGTCTGGCTTACCCCTGCCCCCAGCCAGGTGGCC
CTGCTGCCGGACGCGCTGCGCGGCAGCGGTGTGTGCGCCACCCCGACGCGCTGTACGACGGCGCCCTGG
CGCACCTGGTGGACGGCTTCCGCAACGGCTGGCCGCACTCCGTGCACCAGGTGGGGGAGCGCGGTGCCTG
GATGTCTGGATGGTCACTGGCCGCAAGGCTGTGCGCACCATCGGGTAGAGTGTAACCAAATGATGTGCGC
GCAATGAAGGGTGAGCAGATTCCAGCCTCCCTCTGTGCGCTGGCGTCCAAGTGTGCCAACTGCGCACACA
CCTGCGCACGCCCCAGGCCGACGCTGCTGGCCAAGCTGGAGGCGCAGCAGGCCCGCGCCGCGCATG
CGCCGCGAGCAGTCCGAGCTGGCCGCGCGCGCGCCGACGCCCGCGTGCCATGTACAGCGGTCCCGCCCGCG
CCCACGTTCCACCTGTACACCAACTACAACAACCTGCGCGCAGCGGCAATggcgcgcgcgcgcgcc
gccccgccccATGCCCATGGTGCCAGGGGCGACGGCCAGCACGCCATGGCGGCGTCTGTGGCGGCGCAT
GTGCACTCCACGGCGATGGCGGAGCAcgcgcgcgcgcgcgcggtggcgggcgcgcgcgcgccTCCGATG
GCGGCGCGCACGCCAACGGCGTGGCTCTAGAGCGGGCCGTGTGCGCGTCTGTGCTGGGTGACTACCCGC
GGCGGTGGAGCGGCTGGGGCTAGACACGAACGCGCGGTGGAGCAGGAGCAGCTGCGCGAGTTCTGTCTG
GTGCGCCGGGGAGGGCTACTGCAAAACGTGTTGCTCAGGGTCTTGAGATACCGAACACAATGTTTCTGT
ATACATCTCCCGTCGAGAGAGCTATGCCTCCACCGTCGCGCCGGCTCCACTGCACCCGATGCGGTTGCAG
GCCCACTCGCCCAACGGCCGCGGCGACCTGCGCCCCGGGCTGAGGGCGCTGGCCACCCGCTGGCTGGAGG
GCGTGGCGCTGGCGTCTTCCGCGACACTGCCGGCAGCCCCGTGCCGCCGCTGGAGGCCAGCTGGTTTCGC
GGACCTGCGTGTGCGCTTCTATCTGCAGGTGAGGGGCGGCGAGAAGAGAGGGGGGAAAGGGAGGCGAGAAG
GCGCTTCCGCCGCTGGCGCAACGGGCCATCCTGGTGGAGCACGGCGCTACATCGCATCTGGTCCACCGTC
TCTGGATGTATAATTCTGTGCACTCTTAACCGGCCGCGCAGGTATGGCGGCTGTGCCGCGTGGAGCAGGTG
CTGGCCGCCGCCCACTTCTGGCCAACCTGCTGCCCAACATGCTCAAGgccatcgccggcactgccgtca
aggtcgcagccaacaccgcggtggcagcctcccgcgcgcagcgccctcagcgccaccgtcgcgggcagcac
cgccaccgctcgtcatcttctcttgcgcggcgcgcgctcgtgcccgtgacctgagcgctgccaccgccc
gcccgcacgcgcgcgcgcgcgcgcAGCAGGCGAACGCGGTGCGTGCCAGCATCGTCGGTGTGCTGACGTGTC
CCCCACGAGCAGTGgcgcgcgcgtgcccgc
cggccggtggcgctgcagcttcgcgcctcttcttcttgcgagggcgcgcgctgagggcgctgacctgcgtcgt
cgcttctgcgcaccagcgcgcgcgccagcgcgcgcgctcgGTGCGCCACAGCACCGAGCGCTATGACTG
GGCCCCAGCACGGCGCCGCTCTGTGCGCAGTCGCACCGGGAGGAGGATGAGGATTGCGACGGCGGCCA
GGAGGGGGGGCGTGCCGCGGCGCATGAGCGAGGCGGACCTGCGTGCGCACCTGGCGGGCCTGGAGAAGGCC
ATGTGGGACTCGGAGCTGCCGCCGCCGCCGCATCCCGCGCGCAGAAGGCGCTCACCTACGCCGCGAGGAC
TGGTGAGTTGCTGCGCAGCCTGACGGCCATAGTTGCCGTAGTGCCATAGTGACCGAGCACCGTGATGTTT
AGGACATGGGCGGAGAAGTGTTAGGACATGAATTGCATCAACGCTGCAAATCTGGTGTATGGTACGCGCG

Q

TTCCCTGTCACCAACAAGGCTGTTGACCAAGCTGCTGCTGCCCTTGCACTCTTTCAACGCCCCTCTGCAG
CTGGCCGTGGTGGTGGCCTTCTGGTGTCCAGCTTCTTcgcgcgaacgacggcgccgcctccgccctgg
caccgcgcgcgtcaccaccgcctccgtggcgcTTAGCGCGCAGCCCGCCAAGCCGGGCAAGGCCACCCG
CTCCGCGCACTGA

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>genie.294.6|Transcript (SEQ ID NO:189):
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Protein Sequence

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>genie.294.6 (SEQ ID NO:190):
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MNSAEHVSVAVDYYRMLHVPVRSRPAIRKAYENLVKQPPAAAYSADTLFARAVLLKAAAESLTDPLDRLR
SYDAKLAAGHTALRVSQQDLPGALVVLQEIGEHLVLDLGLRWLEVNNGQPDAGDVAAVALAYCDRAGE
RLTSQLQPPPASALPGPDGAAPHAVHVGAVLPACDDLDAALSCLRRYGMQQQLQQQIVGALRDLAPEYAC
ELAALPLGAETAARRAKGVALMRGVLRAAATVAAATAKPEAAADSDDDDEVDPRSVLAAARRMLTRSRDV
LTCSEQVALLPDALRGSGVSPTPDALYDGAHLVDGFRNGWPHSVHQADQLLAKLEAQQARAAAMRREQ
SELAAAAAARRAMYSGPAAAHGPTLYTNYNNPAGSGNGAPPPPPRPMMPMVPRGDGQHAMAASVAHVHST
AMAEHAARSAAGGAAGASDGGAHANGVALERAVCAVLLGDYTAVERLGLDTNAAVEQEQLREFVLAHSP
NGRGDLRPLRALATRWLEGVALASFRDTAGSPVPPLEASWFADLRVAFYLQVWRLCRVEQVLAAAHFLA
NLLPNMLKAIAGTAVKVAANTAVAASRAORLSATVAASTATASSSSSAARGARAGALSAATAAAHARRQ

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FIG. 8 continued 38/40

QANAVGASIVGADVLPPTAVAAAAAAGTAAAAAVTGPALGRGAAASASSFEEGAAEAADLRRRFVATSRG
ASAAVGAPTAPAAMTGPQHGAASAAQSHREEDEDSHGGQEGGVPRRMSEADLRAHLAGLEKAMWDSELP
PPPSRAQKALTYAAGLLAVVAVFLVSSFFRRNDGAASALAPAAVTTASVAVSAQPAKPGKATRSAH*

Thermosynechococcus elongatus BP-1 tlr0758 (SEQ ID NO:191):

GTGCGCATTCCCCTCGATTATTACCAAGTGTGGGTGTGCCTATTCAGGCAACGCCGGAG
CAAATTGAGCAGGCCTTTCGGGACCGGCTGTTGCAGCTCCCTACCCATCAGCACTCCCC
ACCACAGTTGCCACCCGTCGCGAACTCATTGAGCAGGCCTATGCAGTTTTCGAGAACC
GAGCAGCGCGATGCCCTACGATCGCCACTGCCGTACCGTTGATCCCGATGATTGATTGCC
CAGTTGGATCCCGATGCCACCACTCCCCACATTGAAATTAGTGATGAGCAATTGTCGGGG
GCACTCCTACTGCTGTATGAAGTAGGAAATTATGCCCAAGTTGTCAACCTGGGAGACGCC
TTTCTTAAAAAGGATGTTTTTGAGCGCAATCGCCCTACACTTCCCCTGCCGCCGTTGCC
GACATTACCCTCACTGTGGCTTTGGCCTATCTGGAATTGGGACGGGAGGAATGGCAGCGG
CAGTCCTATGAATCAGCCGCTCTCAGCTAGAAGCCGGTCTCCAGGTACTTCAGCGGGTA
AATTTGTTTCCCGAGCTCCAGGAGCAGTTTCAGACGGAAGTGAATCGGCTGCGTCCCTAC
CGCATTCTGGAATTACTGGCACTGCCTTTGTCCGATAGTGCGAATCGGCAGCGGGTATT
TTATTGCTGCGCAAATGCTGAGTGAGCGCGGGGCATTGAGGGGCGCGGTGACGATCGC
TCAGGACTAACAGTTGAGGATTTCTGAAATTTATTTTGCAACTGCGCAGCCATCTTACC
GTGGCAGAACAAACAGGAAGTCTTTGAACGGGAATCGCGGCGTCCCTCAGCGGTGGCCACC
TACCTTGCGGTACATGCCTTGGTAGCACGGGGAGTGATGAAGTGCAGCCGAGCTATATT
TGTCGGGCCAAGGATTTATTGCAGCAGCTGCTCCCCCATCAAGACGTCTATCTTGAACTT
GCCAGTTGCTTGCTGCTTTTGGGACAGCCACCGAGGCCTTGGCAGCTCTTGACCACAGC
CAAGATCAACCGACTCTGGACTTTATCCGCCGTCATGCCGTGAGGCTGGCGATCGACTG
CCGGGGCTTTATTACTACACACACAATGGCTCACGGAGGAAATTTATCCTGCATTTTCGG
GACTTGGGGGAAACACCCGTGGCCTTGGAGGCTTACTTTGCTGATGCCAATGTCCAAACC
TATCTAGAGGCTCTCAGTGAGGACTCCATTGCCCTGAACCCCTGCGACCACTGCCTCT
GCGCTCCCTGAAGTGATCAGACCAACGGTGGCCGTGCCCCCTCCCCTCTCCTTCACAGCG
GAAACGTTACCGTTGCAGGATCAGAGTCGGCTGGGTGAGGGCCTTTTCGGCATCGGCTTTT
ACCCCTTCTGCAACTGCAACGGGGACATCGATGCCCCAACCATCGCCTCGCAAACGGCGC
AGCCCTCGAAACCGTTGCGCCCAAAACGTCAGACTTGGTTTTGGATGGGTGCAGGAGTG
GTTCTTGTGGGTTTAGGGGCGTTGGCAAAAGTCTATTGGCCCGCCAAACCGCTGAAGCC
CCCCGCGCGCGGTGACACCGGCACCAACTCCTGTGGCAACGCGACCCCAACGCCACAA
CCGACGACCTTAGCCATCACTTTAACACCAGAGATGGCGCGGATCGCCTCCACACTTGG
CAGCAAATTAAGCCCAAGCCCTTGGGCGACCATTTGAGGTGGACAACTAACAACGATT
TTGGCGGAGCCAGAACTCAGCCGCTGGCGATCGCGGCGACAGGGCTTAAAGTCCGAGGGC
AGCTATTGGGTTTATACCCTAAAGAACTTAGAAGTGAAGGAAGTCCGCCTCCAAAGGAGC
GATCGTGTGGAGGTGTTGGCAGAAGTCAACGAGGATGCCCCGTTTCTATGAACAGGGAACC
CTGCGCACTGATATTTCTATAGCGATCCCTACCGGTCATTTATACCTTTATCCGTGCG
GGCAATCAATGGTTGATTCAAGGCATGCAGGTGGTTAGTTAA

Protein sequence:

>tlr0758 (SEQ ID NO:192):

MRIPLDYYQVLGVPIQATPEQIEQAFDRLLQLPTHQHSPTTVATRRELIEQAYAVLREPEQRDAYDRHCRTVDP
DDLIAQLDPDATTPHIEISDEQLSGALLLLYELGNYAQVNLGDAFLKKDVFERNRPYTSPAAVADITLTVALAY
LELGREEWQRQSYESAASQLEAGLQVLQRVNLFPELQEQFTELNRLRPYRILELLALPLSDSANRQGIILLRQ
MLSERGGIEGRGDDRSGLTVEDFLKFIQLRSHLTVAEQQELFERESRRPSAVATYLAVHALVARGVHELQPSYI
CRAKDLLQQLLPHQDVYLELASCLLLLQGPTEALALDHSQDQPTLDFIRRHAGEAGDRLPGLYYTTQWLTEEI
YPAFRDLGETPVALEAYFADANVQTYLEALSIEDSIAPEPPATTASALPEVIRPTVAVPPPLSFTAETLPLQDQSR
LGQGLSASAFTPSATATGTSMPQPSPRKRRSPRNRCAQKRQTFWFMGAGVVLVGLGALAKVYWPAKTAEAPPPV
TPAPTVPATPTPTPQPTTLAITLTPEMARDRLHTWQIQIKALGRPFVVDKLTITLAEPELSRWRSAQGLKSEG
SYWVYTLKNLEVKEVRLQRSRDRVEVLAEVNEDARFYEQGLRTDISYSDPYRVIYTFIRRGNQWLIQGMQVVS

"Replacement Sheet"

FIG. 8 continued 39/40

Trichodesmium erythraeum

Contig97 Gene 8639

(SEQ ID NO:193):

GTGCGGATTCCATTAGATTATTATCGAATTTTAGGTTTACCAATTCAGGCTACTGCTGAACAGTTGCGGCAGGCA
CATCA
AGACCGCACTCAGCAGTTTCCTAGAAGGGAGTATTCTGAAGCCACAATAGTTGCTCGTAAACAGCTTATAGATGA
GGCTT
ATGCTGTTCTTTGCGATCCTGAACAACGTCAAACCTATGATGGTAACTTTTTAGCTAAAACCTACGAGCCAATAG
TAGAA
GAACTCAATCCAAGTTCTCAGATAAATTTTGATCAAGCACAGAAGAAAGAAACCACACTTAAGGAGACTAGAGAA
GTTCT
TCCGGAAATAGCTTCTAAACAGTTAAAAAAGGACAAGTTATCAAAACAGAGAGACTAAAGCTGCCTCTGATTT
TCATT
CTAATACCCCTAGTATAGAAATAGAATATCCACAATTTGTGGGAGCCATCCTAATTTTACATGAGCTAGGAGAAT
ATGAG
CTAGTATTAATAAATAACTCACCTTATCTTCTTAACAATAGTATAACTATTAAAGATGGACGTTTTGGAGACCCA
GCATT
AGTTTTGCCAGATGTTGTCCTTACAGTTGCTCTAGCAAATTTAGAATTGGGCAGAGAGGAATGGCAACAAGGACA
ATACG
AAAGTGCAGCTACAGCTTTAGAGGCTGGCCTAGGGTTATTGCTACGAGAAAACCTATTTGTCCAAATACGAGGAG
AGATA
CAAGCTGACCTTTATAAGCTACGTCCTTATAGAATAATGGAGCTAATAGCACTACCAGAGGAAATAGCTCTAGAC
CGTAG
CCGTGGACTAGAAATCTTCAAGATATGCTCAATGAACGGGGAGGAATTGATGGTCAAGGTGAAGATAGCTCTGG
ACTTG
GGATAGAAGATTTTCTAAAGTTTGTTTCAGCAGCTACGTCAATACTTAACTACAGCAGAGCAAAGAAGTTATTTG
AGGCA
GAAGCCCTTCGCCCTTCGCGAGTTGGTGCATATCTAGCGGTTTATACTTTTTTAGCTCAAGGGTTTGCTCAAAAA
CAACC
AGCCTTTTATTCGTAAAGCTAAGTTGATGTTAATGCAATTGGGTCCGAGTCAAGATGTAAATTTAGAGAAATCTGT
CTGTG
CTTTACTTTTAGGGCAAACCTGAAGAAGCTAGTCGTTTATTAGAACTTAGCCATGAAAATGAACCTCTATCCTTTA
TTAA
GAAAATTCTCAACAATCTCCAGATTTATTGCCAGGTCTATGTCTCTATGCTGAACATTGGTTGACAGAGGAGGTT
TTTCC
ACATTTCCGTGATTTGTCTGACAAGTCAGCTTCTTTGAAAGATTATTTTGCAGATCAACATGTTCAAGCTTATCT
AGAAG
CTTTACCTACAGAAGCAGAGGTAGCTAATCAATGGGTAGTCGTTTACGCTCGTAGTAATCACAATAAAAAAC
AAATG
TTCGACCCCAAGGAAGTTGAGAAGTTGAATGTATCAGATTTGGAGGATAAAGATATTTCTCGGGTAGATGCTACT
GCTAC
TGGTATTGTTGCTTCTGGAAGTCAAGGAAGTTCTAATTTACTAGGGGCTAGTTCTGATGGGTTGCTTCAAGAATT
AGAAA
AATCATCATCTACTAGAGGTGGGCCAAAACAAGTAACTACTAAGAGTTCTAGTCACTATTTAGGAAAAATTAGGG
AAAAG
AGTATAAGTGGTTTACCTGAGTTTAAATGAAAGTACATCTATTGAGAGTGGGGGGTTACCCCAATCTATCCAAGAG
CATAG
TTCACGTAGAAGTTCTGCTAGAAGAGAACCTGTAAAGTTTGGTCGTTTAAATATTAATCGCAATTGTGGGATTTTT
GTAA
TAGGATTTATTGGGTTGTTAACAATTAAAACTATCGGCTGGTTAGTAAATGCTTTAGGATGGGAAAGAGAAAAAC
TGATG
ATACAATTGGATAGGCCTCCTATAGAAATCCCAGAACCTGATCGGGTTAACCTCGCAGCATCAGGACCGATAACA
AAAGA
AGTAGCAAGGCGAACAATTCAAAGTTGGTTAGATATCAAGGCTTCTGCTCTTGGTCCTAATCATAAAATTGAACA
ATTAC

"Replacement Sheet"

FIG. 8 continued 40/40

CAAATATTTTAGTAGAACCGGCACTTTCTCGTTGGTTACCTACAGCTAATGCCCTGAAGCAAGAAAAGTCATACC
GTAGG
TATGAGCATGATTTAGAAAATAAGTAATATAAAGATGAGTAATACAAATTCTAATCTCGCTCAAGTAGATGCTAAA
GTGAT
AGAAAAGGTAGAGTTTTATTCTGACAATGGTAGATTAACTAATACTAACAATGAAAACCTATTTGTTCGTTATGA
TTTAG
TTCGTAAAAGTCAAAAATGGCAAATTAGTAATTGGAAGGTATTGAGATAA

PROTEIN (SEQ ID NO:194):

VRIPLDYYRILGLPIQATAEQLRQAHQDRTQQFPRREYSEATIVARKQLIDEAYAVLCDPEQRQTYDGNFLAKTY
EPIVE
ELNPSSQINFDQAQEKETTLKETREVLPEIASKQLKKRTSYQNRETKAASDFHSNTPSIEIEYPQFVGAILILHE
LGEYE
LVLKITHPYLLNNSITIKDGRFGDPALVLPDVVLTVLANLELGREEWQQGQYESAATALEAGLGLLLRENLFVQ
IRGEI
QADLYKLRPYRIMELIALPEEIALDRSRGLEILQDMLNERGGIDGQGEDSSGLGIEDFLKFVQQLRQYLTTAEQK
KLFEA
EALRPSAVGAYLAVYTFLAQGFAQKQPAFIRKAKMLMQGRSQDVNLEKSVCALLLGQTEEASRSLELSHENEP
LSFIK
ENSQQSPDLLPGLCLYAEHWLTEEVFPHFRDLSDKSASLKDYFADQHVQAYLEALPTEAEVANQWVVVQPRRSNH
NKKQM
FDPKELEKLNVDLEDKDISRVDATATGIVASGSQGSSNLLGASSDGLLQELEKSSSTRGGPKQVTTKSSSHYLG
KIREK
SISGLPEFNESSTIESGGLPQSIQEHSSRRTSARREPVKFGRILILIAIVGFLLIGFIGLLTIKTIGWLVNALGWE
REKLM
IQLDRPPIEIPEDRVNLAASGPITKEVARRTIQSWLDIKASALGPNHKIEQLPNILVEPALSRWLPTANALKQE
KSYRR
YEHDLISNIKMSNTNSNLAQVDAKVIEKVEFYSDNGRLTNTNNENLFVRYDLVRKSQKWQISNWKVLR

Fig. 9

SEQ ID NO:11

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56041 actgtaaatt ttgataaata aaaaaaaaca aaaaaaagat cgccaaatca tatttcatac
56101 tatcagatatt aaacaatata atttgttcga cgatacagaa atattttacc tcacaggaag
56161 aggttgcgca gaaggagcca tggatgtgtt tggtcagagtc gagttgcttt gttgtaagta
56221 ggtaattgca agaaacttga gttgtctata aagcttttga atacttctct ttatatatac
56281 gtttacaaca attttttttt tttttttttt tctattttta caacaaattg ttttttatta
56341 taataataaaa cttaaacgaa aataaataat atctctttgt tctatttctt aaaaaagaaa
56401 ttagcttgta gtacttcaac gtatcttaac tctttagtct ttagtaggta tatatcatct
56461 atttatttat ttttattttt ttttatattac gattatagtgt tacgtacgta tttattaatc
56521 aaaaataact tggtagaagt aaaaagaaaa tgattttttt tttactcagt gatcagtttt
56581 acgtttattc aaaaataagt tgtagtttcc ttcttaatat tcaagttata tgactaaaaa
56641 ttggtcgggt aattttactat taagattaat cggaaactct agttagatca cgagataatc
56701 atcacgtgga gaaacatttg gttcttgtca cgtggagaaa acgttaagct tattttttac
56761 ttctttatta tatttttgag gaaatgggtg aaagaaagag agtggttaaa atgtgaatgc
56821 gctcgtagtt aggtggaggt taatgggtag gaggttaggt catatgtgta ttagtgatgg
56881 ataaaaatta aaacataaaa aaaaacttca agctgtaaat aatctaataa aagaacatag
56941 aaatataatc aaagaaccat ttaactaaat aaatactttc gattcaataa gcataatttct
57001 aagttccaag aatagctatc ctctatccac atgttacatt ttttttttct ttttcacatc
57061 catatagttt taaaataaat tttctagatg gtatttttta ttcgacattt ttttttctct
57121 ttagattttac tgattataat ttatttagaa ataaatgata cgactgtcgt ttctacaaaa
57181 ctgaaatttg caaacatttg accaaaaagc gaaaccttaa tcacttgaaa cgacaacggt
57241 ctttagtatg tttttggaca tacaaagtac acataagatg ttccctcact cttcgattgt
57301 ttcttaacct aatataatta agcaatattg aacttgagtc actcaatgct gcaccgaagg
57361 agcctttaga ttttgagcaa attcatgaga gtttagcttc tcattcatca ctctgaattt
57421 ctcttttatc ctcttttatc gtccaaaaca tgacacataa cataatgta gttctcctgc
57481 atacttccaa tggcaaatag aaaaagagaa cattgatcat agaagtcagt ttggtttacc
57541 cttctgagct cgatctctgt gtcctgttcc ttttgatcaa gtgattgccc gagattcgtg
57601 atgtcgagaa tactatcgag gtctgttcca aatgcgtttt ccaactcttc ccggagaaga
57661 gcaggtaact tatcaacgat gggcattaga agaaaacagt tgaactgcag aacaaaagaa
57721 aacacagata caaacttttt aaaagaaaag tcatttttaa agcaagaaga atctgagtaa
57781 aaactgaagt aggagcaaac ctttaactca gcagaggcga gaaagtactc tcgtatgccc
57841 tggaaatatc gttggacca tgcgtacaca attctctcag aggaaggagc aagcttgccg
57901 ttccaaagtg tgctatctag aagatcagcc aaccgcattt ctggtgtctg aatactggaa
57961 cctgaatcga tgtttgaggt gagatggctt agctttacat ctgatcttga cttggtgtct
58021 gttgtgccac ctaatgcac ttggggaaga ctaaactcta tggcattacc tgatgtcgta
58081 ttatgtctctg ttccaccaa tgagtccaag aattgacgta gaccagctcg gttctacata
58141 acattgagaa acgaaaacta ctcaatcaga aacggatact tgatggtatg tacacaactc
58201 aattggattg aaacagagct atagggctgt agcaatgacc ttgttgtaa gagaccatgt
58261 aacatagcga gttgtacttg ctaaactctc catacatctg caaacaatat aaatccaaa
58321 gggatgatcaa tcaactaaag tcaactagaac acaggtagga ggcaccgaca tggtaagaac
58381 aggaattgga aatagaatta cttgtcacga catgattttt ctgtggactc caaaaactg
58441 ttgaatgctg aagcaaccgc cttgagaaac acctcatgcc cacttaataa ttcactttct
58501 ttctattcaa atttagaaca tacatcaaaa aatttgctgg aaagggatca tgagtatgat
58561 accgtcaaac caaagaaaac agtacctacc tgaagaagat atacagaaat tggagcaat
58621 ctcttgagaa tgtgtagaag cctcgcccc aactatca acgcaaaaac aacgaaaatg
58681 agaactggaa aaaactttct gtatggaag agaaacatgt gaataacaaa atttcagatg
58741 aaagtattcc caaacatagt ttctgttaag agaactgtt tactcgataa ctttagtga
58801 caaataagtt ccagcaaatc tcaaaactga atggtagtat gatttcaata tataacgtta
58861 tatttcattt ttttttttac gtacagtaca ctttaactaa ttagtaaaat tgctttccat
58921 cctccacgaa agaaaaagaa aaaagtagct atatctatgt cacctgatga aggaaaggtt
58981 caaacgtctc acgagccttc gcaactgcta taacacaagc tgttctacaa cagcaataa
59041 gagaaagaga ataagaggcc atagaaaaca tgacaaacgt tgcagctcag attagatact

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Fig. 9, continued 2/3

59101	gaaaggggtc	tgggatgcaa	agacaataaa	ttgagaagtg	tgttgcatgt	cagtcaatcc
59161	tatgatacct	ggaatagttt	gttccatcat	gaatatcctc	aactccacat	gcatttacaa
59221	tttccctcct	cgttattggg	ggacatttga	tagcaccaac	tagaaaacga	aactcagcca
59281	tggcacggtg	atattgtgca	cccccataga	gacgcacccc	tgcattctgt	aaaatgaaag
59341	ataatctggt	tatggtctct	cataattctt	gaagggtccaa	cgaagtatct	cttttatttg
59401	tttccaatac	attattcttt	ggcacatatg	tttcatgcgg	tcaaatttat	cttccatcat
59461	attataatcc	atgtacaaga	acaagacaac	tggatttgaa	gacctgccc	agcttgctct
59521	ataaagtcca	acaatattct	gcttcaggga	aagacttacc	ggtattagct	tatgtgaaaa
59581	ctggagacca	tcagtaccaa	caaatgtctc	tccttggtgc	ctttcatctt	gcagtgtctc
59641	acctgaaaaa	caccatgaga	aattattaac	aatcaaagaa	cccaacataa	agagaatgct
59701	gttataaaaat	gtgcttctgc	cagtaaccaa	agtatcatga	ccaatgattg	attgattagc
59761	tcaataaaca	ccatgtgtaa	tcacgcagat	ctggtgacct	agtcgaattg	aacaaattgc
59821	atttaactaa	actgattttg	caaaagtcca	atttaacaac	acccagaaac	aagaaaagtt
59881	tatgccaaag	aagttgacta	gcagagaaca	gagcagtaac	attaccaaata	ttatctgga
59941	gggccacaac	tgttcccttc	aataacagcg	ataactgatc	aagaaaaata	taaacaaaac
60001	aggtgagaaa	acacagcact	gatcaatact	aacaaaggta	cttcgtacgt	caatcaga
60061	atatgacgca	gcaattttta	agtcttaagg	gcacccaaca	caaaaagttt	acagccattc
60121	tgaatttgta	gcaagtccta	gatatacatt	actgtagcat	aattttatat	gtgtcagtaa
60181	tcaataaaca	aatttgtttt	tatgtgtcag	tagttaataa	accaaataaa	aagagaagtt
60241	tacacaaatg	aacttggtgt	aattatacaa	aaactattaa	tccacgagtc	caggcaaaaa
60301	tgaagaggta	tgggaagggtg	taaatagaaa	tctaaaaaaa	cgaaatgctc	tctacagtta
60361	ccttggttaa	gaagagatca	tggaaagtcc	tgctctctc	tttgagtttt	gcttcaccca
60421	aagagctgca	ttgaaaggaa	ttattcaacc	tccaatgagt	tatatcttct	ataaatcagt
60481	agctaacaat	taaactgcct	aaaatcaagt	agacattttc	agacaaaaca	aattgcgacc
60541	taagttcctt	gctcacggta	tccagctttc	tgactgtact	gcggtactcc	tttccataca
60601	gtggaatgat	caatggaaca	ctctctttgt	acctggaag	agaagggcat	caagactaca
60661	gcgaaaagta	aactacaata	gaaacagagg	ctggaaaaat	cagagttaaa	acaacagtta
60721	taccttttcc	agagtagttc	ttccagaaac	aacctcagtt	tactgatgcc	aatcctactc
60781	ttttcctggt	ttgtcagtaa	acggcccaac	ttcttctcta	aagatgcaat	gtcttccatt
60841	tctctaagtg	acacagcctg	taataaaaaac	cacacatagt	ttagaaaaag	acctgtttta
60901	cttggtttaag	gaatcagaca	gcagagcaga	gacctgtttg	aactcgtcat	tagacttata
60961	cactgaatcc	tgtccatagc	caactcttcc	agaaggcaca	gacgtgaaaa	aaggagaatc
61021	gccccataac	gagctgtcaa	gtgcgcttgc	aggaggtgag	agaaagactt	ccacgtcaga
61081	tgaacatgag	aattgaggga	tttttagtgtc	aagcttttga	gaaacaacaa	ttgtcctaga
61141	aagctcagga	tcaacctaca	tgaacgagaa	acaaacttta	acaaaaataa	agacaagggtt
61201	agacgcaatg	gagttacgtc	aagcaacgta	cttgcatcac	tatccttcga	gtggttgcaa
61261	tgctccagtc	actgctatct	tcgaggcata	aaatgatgaa	ctctttgtgt	tgcatctttg
61321	ctcggactag	agcttccaca	gcccgtgctt	gaacctaaaga	aaaagaacaa	gtaaccact
61381	ctcaaataaa	gcaaaaccaa	aacatgaaat	cagccacgga	attggctgga	agccataaga
61441	aaaaacaacc	tgaagagctc	ggtttttcag	tcctggtgca	ggagcaataa	gtccaggtgt
61501	atcaatgatg	gtaaggtttg	gacaataact	atactggact	ttcacataaa	tctcctttgc
61561	agagaatggg	ctacatggct	cttgctccag	cctcatgttc	tcagcctcaa	tatatgccta
61621	actccaaatc	atataacaaa	tttcgttaac	atgagcattt	cgcttctcta	caataaacct
61681	aagtacttgt	gtttctcaac	attcgtcaaa	atcttcccag	aatttatacg	cagaaacaag
61741	caattgaaga	agcacaagta	ataataataa	caaaacacct	gaatttgtga	gagagatttg
61801	ggaagagaaa	cgaagagatc	atcatcagat	cagagatgac	aaagcgggaa	ttgacactga
61861	ggatcgtact	tcatatggag	agtaatcgcc	cgacgagtct	tgggtccgcc	gccgacatgg
61921	ttaaattgaa	accccataag	agcttccaca	agcgcaactt	taccgtcggt	ctgctgtccc
61981	accacaagaa	ccgcccgtgc	ttcgaaacggc	gtctccaatt	cctgcgccaa	agcgtgtaac
62041	tcgttgtaag	cttcgttaaag	actccaccgc	tcctcaatcg	cagcgtcgtc	ctcttccgcc
62101	atttcctcaa	ccgtcaccga	ttttgctgat	acttccgcc	tcgtctctta	cgaaaatgag
62161	caagaggaag	agtaagagta	agagagtgtc	tcttatttct	tctactcttt	agttttcgtc
62221	gcccgttctt	tttccgccat	ggaattagca	gatacggcta	atttcaattt	ttgtcaaaaag
62281	aaatattttt	tgtgttttaa	tctcacgcgc	atccatggcg	cgttgagtca	acgttgtaat
62341	agttctccgc	taaaatttaa	taaaagagcg	cgtaaggaga	gagtttaagg	attttttttt
62401	tttggtcggc	aaatacaaaag	gatttgcttt	gtcttgacca	atagtatatg	cagaaatatt

Fig. 9, continued 3/3

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62461 atctcaaagg atttgtgata actatgtagt acagaattgt gattattgga tgagaaacca
62521 gaaatatttt gagcaaatga cgacttggtta atttactatt ttttcatttc ttaaaggtct
62581 ctcttgtgta actatgatta aaattgaaat agtgactttt attgttacga catggaacaa
62641 atcaacgagt tctattgtta aagagagaca ttgatgaatg taacaaaact gtggccttaga
62701 agccgaaagg agacttagtt cgggtccctc cttcaccgta ttgctcgttc cattttctca
62761 attcggttcat tgtcgtcgcg tcgtatgcca ctgacggact tacctgcaaa ttacattaca
62821 atgacgcaat ttcgataatg caaacaccag gggaaaaaac atgaatagag atgatgatga
62881 tgttttttaa gagattgatc aataccttag ctttggattg aatgaagtcg tccaaactca
62941 gtggtcgtag atcagggggac gcatttggtta ccgagtcctg ataattcgac gtttcaaaag
63001 catggagtga gtacaaaaat tatttttcgt aacaacagaa atcaacfgtg tgggtttatg
63061 catgtcctta ccttggtttc ttcttgtaac aattcctgaa caggtctgta tgcagctgct
63121 atgcatagat tctgcaatgt aagaaaagaa aaggaatcag aactactgtg ttgaatcata
63181 ctogaacttg taaatgaaac cccgaatgac caaaccttta gatcgcttcc tgaatattct
63241 tcggtttcct ttgcaagttt atcaaaactg aaaccagttt caagattttc tgggtgcaga
63301 aatatcttca atatatctca cgggttttcc gcatctggta aatccacata tatcctataa
63361 acacaagcct caatacaatt atcgaaaaga tacaatatatt ccaaaggaga aattacttga
63421 aagcttaaatt taccgtcttg gtagcctacg aatgacagcg tcatcaagat caaaaggctg
63481 gttgggtggca ccgagaatga gaatcctttg gctatctttt gatctgagtc catcccaagc
63541 tgccataaac tcattttctca ttcttcgtgt tgctcgtgc tcaaaagcac caccacgagc
63601 acccaacaaa ctgtcaacct atacgacaac aaaataaatt acagttagtc cttgagtaac
63661 acatttttacg catcacaaaa gtattcctca taaaaagcaa taaccgaaat tgaaaagtga
63721 tataaagcta aacaatttct cacctcatca acaaatataa tgacgggggc tagtttgctt
63781 gcaaaagaga acaaagcctt cgtgagcttc tctgcatctc caaaccactg tgccaaacaa
63841 tggacgaaat tgacttaaatt cagaaccaat cagaggtaaa gttggaaaga gatttactct
63901 aagttacaat cggcattgac aataataagt cgatgaccgg ggtggaaaag tttttcttat
63961 gtcattagat attctcctta tttatatgaa gatgtttaca aagtgaata tcaacgtgac

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Fig. 10

SEQ ID NO:12

gaaa ttagccgtat ctgctaattc catggcggaa aaaggaacgg
cgacgaaaac taaagagtag aagaaataag agacactctc ttactcttac
tcttcctctt gctcattttc gtaagagacg

ATGGCGGAAGTATCAGCAAATCGGTGACGGTTGAGGAAATGGCGGAAGA
GGACGACGCTGCGATTGAGGAGCGGTGGAGTCTTTACGAAGCTTACAACG
AGTTACACGCTTTGGCGCAGGAATTGGAGACGCCGTTTGAAGCACC GGCG
GTTCTTGTGGTGGGACAGCAGACCGACGGTAAAAGTGCGCTTGTGGAAGC
TCTTATGGGGTTTCAATTTAACCATGTCGGCGGCGGAACCAAGACTCGTC
GGCCGATTACTCTCCATATGAAGTACGATCCTCAgTGTCAATTCCTGCTT
tGTCATCTCGGATCTGATGATGATCCTTCCGTTTCTCTTCCCAAATCTCT
CTCACAAATTCACGCATATATTGAGGCTGAgAACATGAGGCTGGAGCAAG
AGCCATGTaGCCCCATTCTCTGCAAAGGAGATTATTGTGAAAGTCCAGTAT
AAGTATTGTCCAAACCTTACCATCATTGATACACCTGGACTTATTGCTCC
TGCACCAGGACTGAAAAACCGAGCTCTTCAGGTTCAAGCACGGGCTGTGG
AAGCTCTAGTCCGAGCAAAGATGCAACACAAAGAGTTCATCATTTTATGC
CTCGAAGATAGCAGTGACTGGAGCATTGCAACCACTCGAAGGATAGTGAT
GCAAGTTGATCCTGAGCTTTCTAGGACAATTGTTGTTTCTACAAAGCTTG
ACACTAAAATCCCTCAATTCTCATGTTTCATCTGACGTGGAAGTCTTCTC
TCACCTCCTGCAAGCGCACTTGACAGCTCCTTATTGGGCGATTCTCCTTT
TTTCACGTCTGTGCCTTCTGGAAGAGTTGGCTATGGACAGGATTCACTGT
ATAAGTCTAATGACGAGTTCAAACAGGCTGTGTCACTTAGAGAAATGGAA
GACATTGCATCTTTAGAGAAGAAGTTGGGCGGTTTACTGACAAAACAGGA
AAAGAGTAGGATTGGCATCAGTAAACTGAGGTTGTTTCTGGAAGAACTAC
TCTGGAAAAGGTACAAAGAGAGTGTTCCATTGATCATTTCCACTGTTAGGA
AAGGAGTACCGCAGTACAGTCAGAAAGCTGGATACCGTGAGCAAGGAACT
TAGCTCTTTGGATGAAGCAAACTCAAAGAGAGAGGCAGGACTTTCCATG
ATCTCTTCTTAACCAAGTTATCGCTGTTATTGAAGGGAACAGTTGTGGCC
CCTCCAGATAAAATTTGGTGAGACACTGCAAGATGAAAGGACACAAGGAGG
AGCATTTGTTGGTACTGATGGTCTCCAGTTTTTCACATAAGCTAATACaGA
ATGCAGGGATGCGTCTCTATGGGGGTGCACAATATCACCGTGCCATGGC
TGAGTTTTCGTTTTCTAGTTGGTGCTATCAAATGTCCCCCAATAACGAGGG
AGGAAATTGTAAATGCATGTGGAGTTGAGGATATTCATGATGGAACAAA
CTATTCCAGAACAGCTTGTGTTATAGCAGTTGCGAAGGcTCGTgAGACGT
TTGAACcTTTCCTTCATCAGTTAGGGGCGAGGCTTCTACACATTCTCAAG
AGATTGcTTCCAATTTCTGTATATCTTCTTCAGAAAGAAGGTGAATATTT
AAGTGGGCATGAGGTGTTTCTCAAGCGGGTTGCTTCAGCATTCAACAGTT
TTGTGGAGTCCACAGAAAATCATGTCGTGACAAATGTATGGAGGATTTA
GCAAGTACAACCTCGCTATGTTACATGGTCTCTTCACAACAAGAACCGAGC
TGGTCTACGTCAATTCTTGGAcTCATTTGGTGGAACAGAGCATAATACG
ACATCAGGTAATGCCATAgGATTAGTCTTCCCCAAGATGCATTAGGTGG

Fig. 10, continued 2/2

CACAACAGACACCAAGTCAAGATCAGATGTAAAGCTAAGCCAT
CTCGCCTCAAACATCGATTCCAGTTCCAGTATTCAGACAACAGAAATGCG
GTTGGCTGATCTTCTAGATAGCACACTTTGGAACCGCAAGCTTGCTCCTT
CCTCTGAGAGAATTGTGTACGCATTGGTCCAACAGATATTCCAGGGCATA
CGAGAGTACTTTCTCGCCTCTGCTGAGTTAAAGTTCAACTGTTTTCTTCT
AATGCCCATCGTTGATAAGTTACCTGCTCTTCTCCGGGAAGAGTTGGAAA
ACGCATTTGAAGACGACCTCGATAGTATCTTCGACATCACGAATCTCCGG
CAATCACTTGATCAAAAGAAACGGAGCACAGAGATCGAGCTCAGAAGGgT
AAAGAGGATAAAAGAGAAATTCAGAGTGATGAATGAGAAGCTAAACTCTC
ATGAATTTGCTCAAAATCTAAAGGCTCCTTCGGTGCAGCAT

gtgact

caagttcaatattgcttaattatattaggttaagaaacaatcgaagagtg
agggaaacatcttatgtgtactttgtatgtccaaaaacataactaaagaacg
ttgtcgtttcaagtgattaaggtttcgctttttgggtccaatgtttgcaaa
tttcagttttgtagaaacgacagtcgtatcatttatttctaataaatta
taatcagtaaattct

Fig. 11

SEQ ID NO:13

MAEVSAKSVTVEEMAEEDDAAIEERWSLYEAYNELHALAQELETPFEAPAVLVVGQQTGKSALVEALMG
FQFNHVGGGKTTRRPITLHMKYDPQCQFPLCHLGSDDDPSVSLPKSLSQIHAYIEAENMRLEQEPSPFS
AKEIIVKVQYKYCPNLTIIDTPGLIAPAPGLKNRALQVQARAVEALVRAKMQHKEFIILCLEDDSSDWSIA
TTRRIVMQVDELSRTIVVSTKLDTKIPQFSCSSDVEVFLSPPASALDSSLLGDSPPFTSVPSGRVGYGQ
DSVYKSNDEFKQAVSLREMEDIASLEKKLGRLLTKQEKSRIGISKLRFLFLEELLWKRYKESVPLIIPLLG
KEYRSTVRKLDTVSKELSSLDEAKLKERGRTFHDLFLTCLSLLLKGTVVAPPDKFGETLQDERTQGGAFV
GTDGLQFSHKLIQNAGMRLYGGAQYHRAEAFRFLVGAIKCPPITREEIVNACGVEDIHDGTNYSRTACV
IAVAKARETFEPFLHQLGARLLHILKRLLPISVYLLQKEGEYLSGHEVFLKRVASAFNSFVESTESCRD
KCMEDLASTTRYVTWSLHNKNRAGLRQFLDSFGGTEHNTTSGNAIGFSLPQDALGGTTDTKSRSDVKLSH
LASNIDSGSSIQTTEMRLADLLDSTLWNRKLAPSSERIVYALVQQIFQGIREFLASAELKFNCFLMPI
VDKLPALLREELANAFEDDLDSIFDITNLRQSLDQKKRSTEIELRRVKRIKEKFRVMNEKLSHEFAQNL
KAPSVQH

Fig. 12

SEQ ID NO:14

56041 actgtaaatt ttgataaata aaaaaaaca aaaaaaagat cgccaaatca tatttcatac
56101 tatcagattt aaacaatata atttgttcga cgatacagaa atattttacc tcacaggaag
56161 aggttgcgca gaaggagcca tggatgtgtt tgttcgagtc gagttgcttt gttgtaagta
56221 ggtaattgca agaaacttga gttgtctata aagctttgga atacttctct ttatatatac
56281 gtttacaaca attttttttt tttttttttt tctattttta caacaaattg tttttttatta
56341 taataataaa cttaaacgaa aataaataat atctctttgt tctatttctt aaaaaagaaa
56401 ttagcttgta gtacttcaac gtatcttaac tctttagtct ttagtaggta tatatcatct
56461 atttatttat ttttattttt tttatattac gattatagtg tacgtacgta tttattaatc
56521 aaaaataact tggtagaagt aaaaagaaaa tgattttttt tttactcagt gatcagtttt
56581 acgtttattc aaaaataagt tgtagtttcc ttcttaatat tcaagttata tgactaaaaa
56641 ttggtcgggt aatttactat taagattaat cggaaactct agttagacta cgagataatc
56701 atcacgtgga gaaacatttg gttctttgtca cgtggagaaa acgttaagct tattttttac
56761 ttctttatta tatttttgag gaaatgggtg aaagaaagag agtgtttaaa atgtgaatgc
56821 gctcgtagtt aggtggaggt taatgggtag gaggttaggt catatgtgta ttagtgatgg
56881 ataaaaatta aaaacataaa aaaaacttca agctgtaaat aatctaataa aagaacatag
56941 aaatataatc aaagaaccat ttaactaaat aaatactttc gattcaaata gcataattct
57001 aagttccaag aatagctatc ctctatccac atgttacatt ttttttttct ttttcacatc
57061 catatagttt ttaaaataat tttctagatg gtatttttta ttcgacattt ttttttctt
57121 ttagatttac tgattataat ttatttagaa ataaatgata cgactgtcgt ttctacaaaa
57181 ctgaaatttg caaacatttg accaaaaagc gaaaccttaa tcaactgaaa cgacaacgtt
57241 ctttagtatg tttttggaca tacaagtag acataagatg ttccctcact cttcgattgt
57301 ttcttaacct aatataatta agcaatattg aacttgagtc actcaatgct gcaccgaagg
57361 agccttttaga ttttgagcaa attcatgaga gtttagcttc tcatcatca ctctgaattt
57421 ctcttttatc ctcttttatct gtccaaaaca tgacacataa cataatgtta gttctcctgc
57481 atacttccaa tggcaaatag aaaaaagaga cattgatcat agaagtcagt ttggtttacc
57541 cttctgagct cgatctctgt gctccgtttc ttttgatcaa gtgattgccg gagattccgtg
57601 atgtcgaaga tactatcgag gtctgtctta aatgcgtttt ccaactcttc ccggagaaga
57661 gcaggtaact tatcaacgat gggcattaga agaaaacagt tgaactgcag aacaaaagaa
57721 aacacagata caaacttttt aaaagaaaag tcatttttaa agcaagaaga atctgagtaa
57781 aaactgaagt aggagcaaac ctttaactca gcagaggcga gaaagtaact tcgtatgcc
57841 tggaatatct gttggaccaa tgcgtacaca attctctcag aggaaggagc aagcttgccg
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57961 cctgaatcga tgtttgaggc gagatggctt agctttacat ctgattgccg cttggtgtct
58021 gttgtgccac ctaatgcac ttggggaaga ctaaatccta tggcattacc tgatgtcgta
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58201 aattggattg aaacagagct atagggctgt agcaatgacc ttgttgtgaa gagaccatgt
58261 aacatagcga gttgtacttg ctaaatcttc catacatctg caaacaatat aaaatccaaa
58321 gggatgatcaa tcaactaaagc tcaactagaac acaggttaga ggcaccgaca tggtaagaac
58381 aggaattgga aatagaatta cttgtcacga catgattttt ctgtggactc cacaaaactg
58441 ttgaatgctg aagcaaccgc cttgagaaac acctcatgcc cacttaataa ttcaccttct
58501 ttctattcaa atttagaaca tacatcaaaa aatttgctgg aaagggatca tgagtatgat
58561 accgtcaaac caaagaaaac agtacctacc tgaagaagat atacagaaat tgggaagcaat
58621 ctcttgagaa tgtgtagaag cctcgccctt aactatatca acgcaaaaac aacgaaaatg
58681 agaactggaa aaaactttct gtatggaaag agaaacatgt gaataacaaa atttcagatg
58741 aaagtattcc caaacatagt ttctgtaagc agaacatgtt tactcgataa ctcttatgca
58801 caaataagtt ccagcaaatc tcaaaactga atggtagtat gatttcaata tataacgtta
58861 tatttcattt ttttttttac gtacagtaca ccttaactaa ttagtaaaat tgctttccat
58921 cctccacgaa agaaaaagaa aaaagtagct atatctatgt cacctgatga aggaaaggtt
58981 caaacgtctc acgagccttc gcaactgcta taacacaagc tgttctacaa cagcaataa
59041 gagaaagaga ataagaggcc atagaaaaca tgacaaacgt tgcagctcag attagatact

Fig. 12, continued 2/3

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59101 gaaaggggtc tgggatgcaa agacaataaa ttgagaagtg tgttgcatgt cagtcaatcc
59161 tatgatacct ggaatagttt gttccatcat gaatatectc aactccacat gcattttacaa
59221 tttcctccct cgttattggg ggacatttga tagcaccaac tagaaaacga aactcagcca
59281 tggcacgggtg atattgtgca ccccataga gacgcacccc tgcattctgt aaaatgaaag
59341 ataactctggg tatggctctc cataattctt gaagggtccaa cgaagtatct cttttatttg
59401 tttccaatac attattcttt ggcacatatg tttcatgcgg tcaaatttat cttccatcat
59461 attataatcc atgtacaaga acaagacaac tggatttgaa gaccatgccc agcttgctct
59521 ataaagtcca acaatattct gcttcaggga aagacttacc ggtattagct tatgtgaaaa
59581 ctggagacca tcagtaccaa caaatgctcc tcttgtgtc ctttcatctt gcagtgtctc
59641 acctgaaaaa caccatgaga aattattaac aatcaaagaa cccaacataa agagaatgct
59701 gttataaaat gtgcttctgc cagtaaccaaa agtatcatga ccaatgattg attgattagc
59761 atacatcatt ccatgtgtaa tcatcgcagt ctggtgaccc agtcgaattg aacaatatgc
59821 atttaactaa actgattttg caaaagtcca atttaacaac acccagaaac aagaaaagt
59881 tatgccaaag aagttgacta gcagagaaca gagcagtaac attaccaaat ttactctggag
59941 gggccacaac tgttcccttc aataacagcg ataactgatc aagaaaaata taaacaaaac
60001 aggtgagaaa acacagcact gatcaatact aacaaaggta cttcgtactg caatcagaaa
60061 atatgacgca gcaattttta agtcttaagg gcatccaaca caaaaagttt acagccattc
60121 tgaatttgta gcaagtccta gatatacttt actgtagcat aattttatat gtgtcagtaa
60181 tcaataaaca aatttgtttt tatgtgtcag tagttaataa accaaaaaaa aagagaagtt
60241 tacacaaatg aacttgttgt aattatacaa aaactattaa tccacgagtc caggcaaaaa
60301 tgaaaaggta tgggaagggt taaatagaaa tctaaaaaaa cgaaatgctc tctacagtta
60361 ccttggttaa gaagagatca tggaaagtcc tgcctctctc tttgagtttt gcttcatcca
60421 aagagctgca ttgaaaggaa ttattcaacc tccaatgagt tatattttct ataaatcagt
60481 agctaacaat taaactgcct aaaatcaagt agacattttc agacaaaaca aattgcgacc
60541 taagttcctt gctcacggta tccagctttc tgactgtact gcggtactcc tttcctaaca
60601 gtggaatgat caatggaaca ctctctttgt acctggaag agaggggcat caagactaca
60661 gcgaaaagta aactacaata gaaacagagg ctggaaaaat cagagttaaa acaacagtta
60721 taccttttcc agagtgttc ttccagaaac aacctcagtt tactgatgcc aatcctactc
60781 ttttctgtt ttgtcagtaa acggcccaac ttcttctcta aagatgcaat gtcttccatt
60841 tctctaagt acacagcctg taataaaaaa cacacatagt ttagaaaaag acctgtttta
60901 cttgttttaag gaatcagaca gcagagcaga gacctgtttg aactcgtcat tagacttata
60961 cactgaatcc tgtccatagc caactcttcc agaaggcaca gacgtgaaaa aaggagaatc
61021 gcccaataag gagctgtcaa gtgcgttgc agggaggtgag agaaagactt ccacgtcaga
61081 tgaactgag aattgagga ttttagtgc aagctttgta gaaacaacaa ttgtcctaga
61141 aagctcagga tcaacctaca tgaacgagaa acaaaactta acaaaaataa agacaagggt
61201 agacgcaatg gagttacgtc aagcaacgta cttgcatcac tatccttcga gtgggtgcaa
61261 tgetccagtc actgctatct tcgaggcata aaatgatgaa ctctttgtgt tgcattttg
61321 ctcggactag agcttccaca gcccggtgctt gaacctaaag aaaagaacaa gtaaccact
61381 ctcaataaaa gcaaaaccaa aacatgaaat cagccacgga attggtcgga agccataaga
61441 aaaaacaacc tgaagagctc ggtttttcag tctggtgca ggagcaataa gtccaggtgt
61501 atcaatgatg gtaaggtttg gacaatactt atactggact ttcacaataa tctcctttgc
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61621 actccaaatc atataacaaa tttcgttaac atgagcattt cgcttctcta caataaacct
61681 aagtacttgt gtttctcaac attcgtcaaa atcttcccag aatttatacg cagaaacaag
61741 caattgaaga agcacaagta ataataataa caaaacacct gaatttgtga gagagatttg
61801 ggaagagaaa cggaaggatc atcatcagat ccgagatgac aaagcgggaa ttgacactga
61861 ggactgtact tcatatggag agtaatcggc cgacgagctt tggttccgcc gccgacatgg
61921 ttaaattgaa accccataag agcttccaca agcgcacttt taccgtcggg ctgtgtcccc
61981 accacaagaa ccgccggtgc ttcgaacggc gtctccaatt cctgcgcaa agcgtgtaac
62041 tcgttgtaag cttcgtaaag actccaccgc tctcaatcg cagcgtcgtc ctcttcgcc
62101 atttctcaa ccgtcaccga ttttctgat acttccgcca tcgtctctta cgaaaatgag
62161 caagaggaa agtaagagta agagagtgtc tcttatttct tctactctt agttttcgtc
62221 gccgttcctt tttccgccat ggaattagca gatacggcta atttcaattt ttgtcaaaag
62281 aaatattttt tgtgttttaa tctcacgcgc atccatggcg cgttgagtca acgttgtaat
62341 agttctccgc taaattttaa taaaagagcg cgtaaggaga gagtttaagg atttttttt
62401 tttggtcggc aaatacaaa gatttgcttt gtcttgacca atagtatatg cagaaatatt

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Fig. 12, continued 3/3

62461 atctcaaagg atttgtgata actatgtagt acagaattgt gattattgga tgagaaacca
62521 gaaatatttt gagcaaatga cgacttgta atttactatt ttttcatttc ttaaagggtct
62581 ctcttgtgta actatgatta aaattgaaat agtgactttt attgttacga catggaacaa
62641 atcaacgagt tctattgtta aagagagaca ttgatgaatg taacaaaact gtggcttaga
62701 agcgaagg agacttagtt cgggtccctc cttcacgta ttgctcggtc cattttctca
62761 attcgttcat tgcgtcgcg tcgtatgcca ctgacggact tacctgcaa ttacattaca
62821 atgacgcaat ttcgataatg caaacaccag gggaaaaaac atgaatagag atgatgatga
62881 tgttttttaa gagattgatc aataccttag ctttggttg aatgaagtcg tccaaactca

Fig. 13

SEQ ID NO:15

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1  atggcggaag tatcagcaaa atcgggtgacg gttgaggaaa tggcggaaga ggacgacgct
61  gcgattgagg agcgggtggag tctttacgaa gcttacaacg agttacacgc tttggcgag
121  gaattggaga cgccgttcga agcaccggcg gttcttggtg tgggacagca gaccgacggt
181  aaaagtgcgc ttgtggaagc tcttatgggg tttcaattta accatgtcgg cggcggaacc
241  aagactcgtc ggccgattac tctccatatg aagtacgata ctcagtgtca attcccgctt
301  tgtcatctcg gatctgatga tgatccttcc gtttctcttc ccaaactctc ctcacaaatt
361  caggcatata ttgaggctga gaacatgagg ctggagcaag agccatgtag ccattctct
421  gcaaaggaga ttattgtgaa agtcagtat agtattgtc caaaccttac catcattgat
481  acacctggac ttattgctcc tgcaccagga ctgaaaaacc gagctcttca ggttcaagca
541  cgggctgtgg aagctctagt ccgagcaaag atgcaacaca aagagttcat cattttatgc
601  ctggaagata gcagtgactg gagcattgca accactcgaa ggatagtgat gcaagttgat
661  cctgagcttt ctaggacaat tgttgtttct acaaagcttg acactaaaat ccctcaattc
721  tcatgttcat ctgacgtgga agtccttctc tcacctctg caagcgact tgacagctcc
781  ttattgggcg attctccttt tttcacgtct gtgccttctg gaagagttgg ctatggacag
841  gattcagtgat ataagtctaa tgacgagttc aaacaggctg tgtcacttag agaaatggaa
901  gacattgcat ctttagagaa gaagttgggc cgtttactga caaacagga aaagagtagg
961  attggcatca gtaaaactgag gttgtttctg gaagaactac tctggaaaag gtacaaagag
1021  agtggtccat tgatcattcc actgttagga aaggagtacc gcagtacagt cagaaagctg
1081  gataccttat cgctgttatt gaagggaaca gttgtggccc ctccagataa atttggtgag
1141  aactgcaag atgaaaggac acaaggagga gcatttggtg gtactgatgg tctccagttt
1201  tcacataagc taataccgaa tgcagggatg cgtctctatg ggggtgcaca atatcacgt
1261  gccatggctg agtttcgttt tctagttggg gctatcaaat gtccccaat aacgagggag
1321  gaaattgtaa atgcatgtgg agttgaggat attcatgatg gaacaaacta ttccagaaca
1381  gcttggtgta tagcagttgc gaaggctcgt gagacgtttg aacctttcct tcatcagaaa
1441  gttttttcca gttctcattt tcgtttggtt tgcgttgata tagttagggg cgaggcttct
1501  acacattctc aagagattgc ttccaatttc tgtatatctt cttcaggtag gtactgtttt
1561  ctttggtttg acgggtgaata ttttaagtgg catgaggtgt ttctcaagcg ggttgcttca
1621  gcattcaaca gttttgtgga gtccacagaa aaatcatgtc gtgacaaatg tatggaggat
1681  ttagcaagta caactcgcta tgttacatgg tctcttcaca acaagaaccg agctggtcta
1741  cgtcaattct tggactcatt tgggtggaaca gagcataata cgacatcagg taatgccata
1801  ggatttagtc ttccccaaga tgcattaggt ggcacaacag acaccaagtc aagatcagat
1861  gtaaagctaa gccatctcgc ctcaaacatc gattcaggtt ccagtattca gacaacagaa
1921  atgcggttggt ctgatcttct agatagcaca ctttgggaacc gcaagcttgc tccttctct
1981  gagagaattg tgtacgcatt ggtccaacag atattccagg gcatacgaga gtactttctc
2041  gcctctgctg agttaaagtt caactgtttt cttctaatagc ccacgttga taagttacct
2101  gctcttctcc gggaagagtt ggaaaacgca tttgaagacg acctcgatag tatcttcgac
2161  atcacgaatc tccggcaatc acttgatcaa aagaaacgga gcacagagat cgagctcaga
2221  aggataaaga ggataaaaga gaaattcaga gtgatgaatg agaagctaaa ctctcatgaa
2281  tttgctcaaa atctaaaggc tccttcgggt cagcattga

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Fig. 14

SEQ ID NO:16

MAEVSAKSVTVEEMAEEDDAAIEERWSLYEAYNELHALAQELETPEAPAVLVVGQQTD
GKSALVEALMGFQFNHVGGGTKTRRPITLHMKYDPQCQFPLCHLGSDDDPSVSLPKSLS
QIQAYIEAENMRLEQEPCSPFSAKEIIVKVQYKYCPNLTIIDTPGLIAPAPGLKNRALQ
VQARAVEALVRAKMQHKEFIILCLEDSSDWSIATTRIVMQVDPELSRTIVVSTKLDTK
IPQFSCSSDVEVFLSPPASALDSSLLGDSPPFTSVPSGRVGYQDSVYKSNDEFKQAVS
LREMEDIASLEKKLGRLLTQEKSRIGISKLRFLLELLWKRYKESVPLIIPLLGKEYR
STVRKLDTLSLLLKGTVVAPPDKFGETLQDERTQGGAFVGTGDLQFSHKLIIPNAGMRLY
GGAQYHRAMAEFRFLVGAIKCPPIITREEIVNACGVEDIHDGTNYSRTACVIAVAKARET
FEPFLHQKVFSSSHFRFCVDIVRGEASTHSQEIASNFCISSSGRYCFLWFDGEYLSGH
EVFLKRVASAFNSFVESTESCRDKCMEDLASTTRYVTWSLHNKNRAGLRQFLDSFGGT
EHNTTSGNAIGFSLPQDALGGTTDTKSRSDVKLSHLASNIDSGSSIQTTEMLADLLDS
TLWNRKLAPSSERIVYALVQQIFQGIREYFLASAEKFNCFLLMPIVDKLPALLREELE
NAFEDDLDSIFDITNLRQSLDQKKRSTEIELRRIKRIKEKFRVMNEKLNSHEFAQNLKA
PSVQH

Fig. 15

SEQ ID NO:17

MQELYTNRTVLNRPRFAVNVRPTRLKRNQQSQSKMQSHSKDPIN
AESRSRFEAYNRLQAAAVAFGEKLPIPEIVAIGGQSDGKSSLLEALLGFRFNVREVEM
GTRRPLILQMVDLSALEPRCRFQISRIFVELAILITDLDEDSEYGSPIVSATAVA
DVIRSRTTEALLKKTAVSPKPIVMRAEYAHCPNLTIIDTPGFVLKAKKGEPETTPDE
ILSMVKSLASPPHRIILLFLQQSSVEWCSSLWLDVREIDSSFRRTIVVSKFDNRLKE
FSDRGEVDRYLSASGYLGENTRPYFVALPKDRSTISNDEFRRQISQVDTEVIRHLREG
VKGGFDEEKFRSCIGFGSLRDFLESELQKRYKEAAPATLALLEERCSEVTDDMLRMDM
KIQATSDVAHLRKAAMLYTASISNHVGALIDGAANPAPEQWGKTTEEERGESGIGSWP
GVSVDIKPPNAVLKLYGGAAFERVIHEFRCAAYSIECPPVSREKVANILLAHAGRGGG
RGVTEASAEIARTAAARSWLAPLLDTACDRLAFVLGSLFEIALERNLNQNSEYEKKTEN
MDGYVGFHAAVRNCYSRFVKNLAKQCKQLVRHHLDSVTSPYSMACYENNYHQGAFGA
YNKFNQASPNSFCFELSDTSRDEPMKDQENIPPEKNNGQETTPGKGGESHITVPETPS
PDQPCEIVYGLVKKEIGNPGDGVGARKRMARMVGNRNIEPFRVQNGGLMFANADNGMK
SSSAYSEICSSAAQHFAIREVLVERSVTSTLNSGFLTPCRDRLVVALGLDLFAVNDD
KFMDMFVAPGAIVVLQNERQQLOKQKILQSCLTEFKTVARSL"

Fig. 16

SEQ ID NO:18

MANSNTYLTTPTKTPSSRRNQSQSKMQSHSKDPINAESRSRFEAYNRLQAAAVAFGEK
LPIPEIVAIGGQSDGKSSLLLEALLGFRFNVREVMGTRRPLILQMVHDL SALEPRCRFQ
DEDSEYGSPIVSATAVADVIRSRTEALLKKTAVSPKPIVMRAEYAHCPNLTIIDTP
GFVLKAKKGEPETTPDEILSMVKSLASPPHRILLFLQSSVEWCSSLWLDAREIDSSF
RRTIVVVSKEFDNRLKEFSRGEVDRLSASGYLGENTRPFVALPKDRSTISNDEFRRQ
ISQVDTEVIRHLREGVKGGFDEEKFRSCIGFGLRDFLESELQKRYKEAAPATLALLEE
RCSEVTDDMLRMDMKIQATSDVAHLRKAAMLYTASISNHVGALIDGAANPAPEQWGKTT
EEERGEGIGSWPGVSVDIKPPNAVLKLYGGAAFERVIHEFRCAAYSIECPPVSREKVA
NILLAHAGRGGGRGVTEASAEIARTAAWSLAPLLDTACDRLAFVLGSLFEIALERNLN
QNSEYEKKTENMDGYVGFHAAVRNCYSRFVKNLAKQCKQLVRHHLDSVTSPYSMACYEN
NYHQGGAFGAYNKFNQASPNFSCFELS DTSRDEPMKDQENIPPEKNNGQETTPGKGGES
HITVPETPSPDQPCEIVYGLVKKEIGNGPDGVGARKRMARMVGNRNIEPFRVQNGGLMF
ANADNGMKSSSAYSEICSSAAQHFAIREVLVERS VTSTLNSGFLTPCRDLVVALGLD
LFAVNDDKFMDMFVAPGAIIVVLQNERQQQLQKRQKILQSCLTEFKTVARSL

Fig. 17

SEQ ID NO:19

```

1  ttcattgttct tagaagttct aaatthttgat catctctttat ttgaaagctc aactaaaata
61 gctatgatat cattccctga tgctacgtac taggtttttta aattcataca cacacaaatc
121 tataattaaa acttggttaa ttcatacaca caaaggacaa atcttcttcg tattaaaaaa
181 gatggaggct ctggaacatc tagtggtgcc gtatcactta cttgactggt tcaagccggt
241 tgtctttgtt tggagaagt aaatttaatt gtgggagagg gatttcacga atttaaactc
301 gtttttctcc cttttcgtgg tatactttgg accttttggg tatgaacaca tatgtgaaaa
361 cgttaattca tgtgtttgaa aagtaattaa tcgcgccgtc cgtcttatag ctttgggatg
421 ggccaatagg atatttaaga gataagaaaa ctaatcagaa acacagacga aggtatctca
481 ctctctctct ttctctctcc ATGAGAACTC TAATCTCTCA CCGGCAATGT GTGACGTCAC
541 CGTTTCTTAT CTCCGCCGCA TCTCCACCGT TTCTTGCCCG GTGCTTTAAG TTATCCTCCT
601 TTAATCTCTC ACGTCATAGG CGTTTTTCTT CTCTCTCGAT CAGAAACATT TCGCATGAAT
661 CCGCCGATCA GACTTCTTCT TCTAGGCCGC GAACTCTTTA TCCTGGTGGT TACAAGCGTC
721 CCGAACTCGC CGTTCCCGGT TTAATCTCTC GGCTAGACGC CGACGAGGTT ATGAGCGGGA
781 ATCGTGAAGA GACTCTTGAT TTGGTCGACC GTGCTTTAGC TAAATCGGTT CAAATCGTCG
841 TGATTGATGG CGGAGCCACC GCTGGTAAGC TCTACGAGGC GGCTTGTGTT GGTAAATCAC
901 TTGTCAAAGG CCGTGCTTAC CTCTTGATCG CTGAACGTGT TGATATCGCC TCCGCCGTTG
961 GTGCTAGTGG TGTGCTCTC TCCGACGAAG gtaacaactg atttcattca gtttttagcat
1021 ttaattttctc atagagttag ttttgtctct caatgctatg tacagGTCTT CCGGCGATTG
1081 TGGCGAGAAA CACATTGATG GGATCCAACC CCGACTCGGT ACTTCTTCCA CTGGTAGCTC
1141 GGATTGTGAA GGATGTTGAT TCTGCTCTAA TTGCCTCAAG CTCCGAGGGT GCTGATTTCC
1201 TTATACTTGG ATCTGGTGAA GAAGATACGC AAGTGGCGGA TTCTTTGTTG AAGAGCGTGA
1261 AAATACCGAT ATATGTGACT TGCAGAGGCA ATGAAGAAGC TAAAGAAGAA TTGCAGTTAC
1321 TGAAATCAGG TGTTTCTGGT TTTGTTATTT CGTTGAAAGA TTTGCGTTCT TCTAGGGATG
1381 TAGCTCTTCG CCAGAGTCTT GATGGAGCTT ATGTTGTAAA TAATCATGAG ACACAAAATA
1441 TGAATGAACT GCCGGAGAAA AAGAAATCTG CTGGCTTCAT AAAATTAGAG GACAAACAGA
1501 AACTAATAGT AGAAATGGAG AAATCTGTGT TGAGAGAGAC GATTGAAATC ATCCACAAGG
1561 CGGCTCCACT Ggtgattttt atttcaaaca tttggtagtt gaagtcaatt ttttgaaatg
1621 gttctaagta ggtttttgtg tggttataat atggtttcat ttacttcttc gactattttt
1681 cattaacagA TGGAGGAAGT CTCCCTTCTA ATTGATGCTG TTTCTCGGAT CGATGAGCCG
1741 TTTCTGATGG TTATAGTGgt aattctgcac tcaactccgt caaattgtga ttccaggaat
1801 ttgcattggt attagctcta tattcattcc agaaacattt tagttacaca cttttgccag
1861 cactagatag cttgagatac aatgggcatg cttctagtca cttgtccttt agtgcttctc
1921 aatatcttct ttcgtcgctc atgactatga ttttctgctt cttcttttgt tctgtctatg
1981 cttctcttct taatttgctt atggatctgg ttgtaaggga actgcatatt tcttaactgt
2041 accatctgct tgtgtacata gttttttcgc tttcttgtga cttgtgagta tgccgttctt
2101 ggaagatggt ttaagtggga caagtgcct ttatgattca aaatagtttt tgtatggata
2161 attaatggga atccacaatt tgctggtagt agGGGGAATT TAACTCTGGA AAATCAACGG
2221 TTATCAATGC ACTTCTTGGG AAGAGATACC TGAAAGAAGG GGTAGTCCCC ACTACCAATG
2281 AAATCACGTT TCTGTGCTAC TCTGACTTGG AATCCGAAGA GCAACAACGT TGCCAAACAC
2341 ATCCAGATGG CCAATATGTA TGCTATCTTC CTGCACCAAT ACTTAAGGAT gtgagtaatt
2401 caaaattcta ccatcgagc cctgaatttt tactaattat ttggaggaat tgatttggtg
2461 tgttctcctt tcgagcagAT AAATATTGTT GACACACCTG GGACCAATGT GATCCTTCAA
2521 AGGCAACAGC GTCTTACAGA AGAATTTGTT CCACGTGCAG ATTTGCTTGT TTTTGTTCCT
2581 TCTGCTGACC GCCCTTTAAC TGAAAGTGAG gtagaagtta ccgtttttact tggcatgtta
2641 gttgttggtt tttttgctca atatgtatct gcctaagtag cttgttagat ctatttttca
2701 cgaaagtagt tagttaagtc atgtatagac catcaagacc ttgtgtaggg aagggaagt
2761 tgtcactagg ttgaatgcat atatcaaggt tttgttgatt ataaatttaa actagactaa
2821 tttattttca aagtaatgag tgttatagct attgctggaa ccagtatgtc ctggttggtc
2881 atattttggt aaagcttagg ccaatacatt tgagaggtga gttgttattg gtacagcaaa
2941 actgatttta cgtccatggc aaattgtatg taaatgatca tctacgaagt actaacctta

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Fig. 17, continued 2/2

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3001 tgaatatttg gttcttattt tgaaaatctg aaaaagtthc aaaagaagga ataagcttct
3061 caatgtcatc atacccatgt catttctatc tctacctctg gagcttcctg ctgtcttgat
3121 tttactgtag gctgatttac atctcattgc gtttgtcagG TTGCGTTTCT CCGGTACACA
3181 CAGCAGTGGA AAAAGAAATT TGTGTTTATT CTGAATAAAT CTGATATCTA TCGTGATGCT
3241 CGTGAGgttt atcagaaaca atatttatgt cttttccttg atagtctctg taattgctgg
3301 atttttcttg actaaagatt aattttactg ctgcagCTTG AGGAAGCTAT TTCATTTGTT
3361 AAAGAGAATA CACGGAAGTT GCTTAATACA GAAAATGTGA TATTGTATCC GGTGTCCGCA
3421 CGGTCTGCTC TTGAGGCGAA GCTTTCAACA GCTTCTTTGG TTGGCAGAGA TGATCTTGAG
3481 ATCGCAGATC CTGGTTCTAA TTGGAGAGTC CAGAGCTTCA ATGAACTTGA GAAATTTCTT
3541 TATAGCTTCT TGGATAGCTC AACAGCTACC GGGATGGAGA GAATAAGGCT TAAATTGGAG
3601 ACACCCATGG CGATTGCTGA GCGTCTCCTT TCTTCTGTGG AAGCTCTTGT GAGACAAGAT
3661 TGCCTAGCTG CTAGGGAAGA CTTGGCTTCA GCAGACAAGA TTATCAGTCG AACTAAAGAA
3721 TACGCGCTTA AGATGGAATA TGAGAGCATT TCTTGGAGAA GGCAGGCTCT CTCGTTGGTA
3781 TAAattctat tagatattat cttgttgaat cacgaaggag gaaattggat tgttctaact
3841 tggctttttt gtgttttgta ctctggcttt tatcgcagat tgataatgcc agattacaag
3901 ttgttgatct gataggaact accctgcgac tatcaagcct tgatcttgcg atctcgtacg
3961 tgttcaaagg ggaaaaatcg gcctcagtag cagctacatc caaagttcaa ggtgaaatac
4021 tcgctccagc actcacaaat gcgaaagtaa gtgtgatgct ttattctttg agtattggcc
4081 taactgggga catgttggtc atatatatga ggtctgagat atagtcacta ttcatgcaga
4141 aagtaaatat tgtctaacaa tgtcttggtg tgacctgatt gactttacat ttcactgttt
4201 gcaggaattg cttggaaaat atgctgaatg gctacaatca aatactgccc gtgaaggagg
4261 tctgtctctg aaatcattcg aaa

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Fig. 18

SEQ ID NO:20

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1  ATGAGAACTC TAATCTCTCA CCGGCAATGT GTGACGTCAC CGTTTCTTAT CTCCGCCGCA
61 TCTCCACCGT TTCCTGGCCG GTGCTTTAAG TTATCCTCCT TTA CTCTCTCC ACGTCATAGG
121 CGTTTTTCTT CTCTCTCGAT CAGAAACATT TCGCATGAAT CCGCCGATCA GACTTCTTCT
181 TCTAGGCCGC GAACTCTTTA TCCTGGTGGT TACAAGCGTC CCGAACTCGC CGTTCCCGGT
241 TTA CTCTCTCC GGCTAGACGC CGACGAGGTT ATGAGCGGGA ATCGTGAAGA GACTCTTGAT
301 TTGGTCGACC GTGCTTTAGC TAAATCGGTT CAAATCGTCG TGATTGATGG CGGAGCCACC
361 GCTGGTAAGC TCTACGAGGC GGCTTGTTTG CTGAAATCAC TTGTCAAAGG CCGTGCTTAC
421 CTCTTGATCG CTGAACGTGT TGATATCGCC TCCGCCGTTG GTGCTAGTGG TGTTGCTCTC
481 TCCGACGAAG GTCTTCCGGC GATTGTGGCG AGAAACACAT TGATGGGATC CAACCCCGAC
541 TCGGTACTTC TTCCACTGGT AGCTCGGATT GTGAAGGATG TTGATTCTGC TCTAATTGCC
601 TCAAGCTCCG AGGGTGCTGA TTTCTTATA CTTGGATCTG GTGAAGAAGA TACGCAAGTG
661 GCGGATTCTT TGTTGAAGAG CGTGAAAATA CCGATATATG TGACTTGCAG AGGCAATGAA
721 GAAGCTAAAG AAGAATTGCA GTTACTGAAA TCAGGTGTTT CTGGTTTTGT TATTTCTGTTG
781 AAAGATTTGC GTTCTTCTAG GGATGTAGCT CTTGCCCAGA GTCTTGATGG AGCTTATGTT
841 GTAAATAATC ATGAGACACA AAATATGAAT GAACTGCCGG AGAAAAAGAA TTCTGCTGGC
901 TTCATAAAAT TAGAGGACAA ACAGAAACTA ATAGTAGAAA TGGAGAAATC TGTGTTGAGA
961 GAGACGATTG AAATCATCCA CAAGGCGGCT CCACTGATGG AGGAAGTCTC CCTTCTAATT
1021 GATGCTGTTT CTCGGATCGA TGAGCCGTTT CTGATGGTTA TAGTGGGGGA ATTTAACTCT
1081 GGAAAATCAA CGGTTATCAA TGCACTTCTT GGGAAGAGAT ACCTGAAAGA AGGGGTAGTC
1141 CCCACTACCA ATGAAATCAC GTTTCTGTGC TACTCTGACT TGGAATCCGA AGAGCAACAA
1201 CGTTGCCAAA CACATCCAGA TGGCCAATAT GTATGCTATC TTCCTGCACC AATACTTAAG
1261 GATATAAATA TTGTTGACAC ACCTGGGACC AATGTGATCC TTCAAAGGCA ACAGCGTCTT
1321 ACAGAAGAAT TTGTTCCACG TGCAGATTTG CTTGTTTTTG TTCTTTCTGC TGACCGCCCT
1381 TTA ACTGAAA GTGAGGTTGC GTTTCTCCGG TACACACAGC AGTGGAAAAA GAAATTTGTG
1441 TTTATTCTGA ATAAATCTGA TATCTATCGT GATGCTCGTG AGCTTGAGGA AGCTATTTCA
1501 TTTGTTAAAG AGAATACACG GAAGTTGCTT AATACAGAAA ATGTGATATT GTATCCGGTG
1561 TCCGCACGGT CTGCTCTTGA GGCGAAGCTT TCAACAGCTT CTTTGGTTGG CAGAGATGAT
1621 CTTGAGATCG CAGATCCTGG TTCTAATTGG AGAGTCCAGA GCTTCAATGA ACTTGAGAAA
1681 TTTCTTTATA GCTTCTTGGA TAGCTCAACA GCTACCGGGA TGGAGAGAAT AAGGCTTAAA
1741 TTGGAGACAC CCATGGCGAT TGCTGAGCGT CTCCTTTCTT CTGTGGAAGC TCTTGTGAGA
1801 CAAGATTGCC TAGCTGCTAG GGAAGACTTG GCTTCAGCAG ACAAGATTAT CAGTCGAACT
1861 AAAGAATACG CGCTTAAGAT GGAATATGAG AGCATTTCTT GGAGAAGGCA GGCTCTCTCG
1921 TTGGTATAA
```

Fig. 19

SEQ ID NO:21

MRTLISHRQC VTSPFLISAA SPPFPGRCFK LSSFTPPRHR RFSSLSIRNI SHESADQTSS
SRPRTLYPGG YKRPELAVPG LLLRLDADEV MSGNREETLD LVDRALAKSV QIVVIDGGAT
AGKLYEAACL LKSLVKGRAY LLIAERVDIA SAVGASGVAL SDEGLPAIVA RNTLMGSNPD
SVLLPLVARI VKDVDSALIA SSSEGADFLI LGSGEEDTQV ADSLLKSVKI PIYVTCRGNE
EAKEELQLLK SGVSGFVISL KDLRSSRDVA LRQSLDGAYV VNNHETQNMN ELPEKKNSAG
FIKLEDKQKL IVEMEKSVLR ETIEIIHCAA PLMEEVSLLI DAVSRIDEPF LMVIVGEFNS
GKSTVINALL GKRYLKEGVV PTTNEITFLC YSDLESEEQQ RCQTHPDGQY VCYLPAPILK
DINIVDTPGT NVILQRQORL TEEFVPRADL LVFVLSADRP LTESEVAFLR YTQQWKKKFV
FILNKSDIYR DARELEEAIIS FVKENTRKLL NTENVILYPV SARSALEAKL STASLVGRDD
LEIADPGSNW RVQSFNELEK FLYSFLDSST ATGMERIRLK LETPMAIAER LLSSVEALVR
QDCLAAREDL ASADKIISRT KEYALKMEYE SISWRRQALS LV

Fig. 20

SEQ ID NO:22

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1  actgtcacaa agaactagaa aaggcaagca aaactcaact atgtcaaaag tgtcacttag
61  attgattctt gaatagcgag acgaagtatc tgggaaaata cgggtactgaa ttaacatctc
121 cgtcagatca taggttcgga ttgaacagat gacacaatta aacaatgatg aagatcaaga
181 cactttaatc gactgaattc tagttagaac ttagactaaa agtattttaat acttgaagct
241 caccacttct cgaatatctt gttccaatcg ttttgatgtg gttccggcac tcaagttctg
301 tattgttttc aagctgactt tatcagtttt ctgaagtaag tcatatgtgt ctatgccccaa
361 ttgcgttttt gaattgacat atgtttggcca tttgttttcg aatgatttca gagacagact
421 ccttccacgg gcagtatttg attgtagcca ttcagcatat tttccaagca attcctgcaa
481 acagtgaaat gttaaagtcaa tcaggtcaca acaagacatt gttagacaat atttactttc
541 tgcattgaata gtgactatat ctccagacctc atatatatga ccaacatgtc ccagtttagg
601 ccaataactca aagaataaag catcacactt acttttcgcat ttgtgagtg c tggagcgagt
661 atttcacctt gaactttgga tgtagtgtgt actgaaggcgg atttttcccc tttgaacacg
721 tacgagatcg caagatcaag gcttgatagt cgcagggtag ttcctatcag atcaacaact
781 tgtaatctgg cattatcaat ctgcgataaa agccagagta caaaacacaa aaaagccaag
841 ttagaacaat ccaatttctt ccttcgtgat tcaacaagat aatatctaat agaatttata
901 ccaacgagag agcctgcctt ctccaagaaa tgctctcata ttcctctta agcgcgtatt
961 ctttagttcg actgataatc ttgtctgctg aagccaagtc ttccttagca gctaggcaat
1021 cttgtctcac aagagcttcc acagaagaaa ggagacgctc agcaatcgcc atgggtgtct
1081 ccaattttaag ccttattctc tccatcccg tagctgttga gctatccaag aagctataaa
1141 gaaattttctc aagttcattg aagctctgga ctctccaatt agaaccagga tctgcgatct
1201 caagatcatc tctgccaacc aaagaagctg ttgaaagctt cgctcaaga gcagaccgtg
1261 cggacaccgg atacaatata acattttctg tattaagcaa ctccgtgta ttctctttaa
1321 caaatgaaat agcttctca agctgcagca gtaaaattaa tctttagtca agaaaaatcc
1381 agcaattaca gagactatca aggaaaagac ataaatattg tttctgataa acctcacgag
1441 catcacgata gatatcagat ttattcagaa taaacacaaa tttctttttc cactgctgtg
1501 tgtaccggag aaacgcaacc tgacaaacgc aatgagatgt aaatcagcct acagtaaaat
1561 caagacagca ggaagctcca gaggtagaga tagaaatgac atgggtatga tgacattgag
1621 aagcttattc cttcttttga aactttttca gattttcaaa ataagaacca aatattcata
1681 aggttagtac ttcgtagatg atcattttaca tacaatttgc catggacgta aaatcagttt
1741 tgctgtacca ataacaactc acctctcaaa tgtattggcc taagctttac caaaatatgg
1801 accaacagga catactgggt ccagcaatag ctataacact cattactttg aaaataaatt
1861 agtctagttt aaatttataa tcaacaaaac cttgatataat gcattcaacc tagtgacaac
1921 tttcccttcc ctacacaagg tcttgatggg ctatacatga cttaactaac tactttcgtg
1981 taaaaatagat ctaacaagct acttaggcag atacatatgt agcaaaaaca acaacaacta
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2521 tccatacaaa aactattttg aatcataaag gcaacttgct ccacttaaaa catcttccaa
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2641 agttaagaaa tatgcagttc ccttacaacc agatccataa gcaaattaag aagagaagca
2701 tagacagaac aaaagaagaa gcgaaacatc atagtcatag gcgacgaaag aagatattga
2761 gaagcactaa aggacaagtg actagaagca tgcccattgt atctcaagct atctagtgt
2821 ggcaaaagtg tgtaactaaa atgtttctgg aatgaatata gagctaatac caatgcaaat
2881 tcctggaatc acaatttgac ggagttgagt gcagaattac cactataacc atcagaaacg
2941 gctcatcgat ccgagaaaca gcatcaatta gaaggagac ttcctccatc tgtaaatgaa
```

Fig. 20, continued 2/2

3001	aaatagtcga	agaagtaaat	gaaaccatat	tataaccaca	caaaaaccta	cttagaacca
3061	tttcaaaaaa	ttgacttcaa	ctaccaaatg	tttgaaataa	aatcaccag	tggagccgcc
3121	ttgtggatga	tttcaatcgt	ctctctcaac	acagatttct	ccatttctac	tattagtttc
3181	tgtttgctct	ctaattttat	gaagccagca	gaattctttt	tctccggcag	ttcattcata
3241	ttttgtgtct	catgattatt	tacaacataa	gtcccatcaa	gactctggcg	aagagctaca
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3361	aactgcaatt	cttcttttagc	ttcttcattg	cctctgcaag	tcacatatat	cggtattttc
3421	acgctcttca	acaaagaadc	cgccacttgc	gtatcttctt	caccagatcc	aagtataagg
3481	aaatcagcac	cctcggagct	tgaggcaatt	agagcagaat	caacatcctt	cacaatccga
3541	gctaccagtg	gaagaagtac	cgagtcgggg	ttggatccca	tcaatgtgtt	tctcgccaca
3601	atcgccggaa	gacctgtaca	tagcattgag	agacaaaact	cactctatga	gaaattaaat
3661	gctaaaactg	aatgaaatca	gttgttacct	tcgtcggaga	gagcaacacc	actagcacca
3721	acggcggagg	cgatatcaac	acgttcagcg	atcaagaggt	aagcacggcc	tttgacaagt
3781	gatttcagca	aacaagccgc	ctcgtagagc	ttaccagcgg	tggtctcgcc	atcaatcacg
3841	acgatttgaa	ccgatttagc	taaagcacgg	tcgaccaaact	caagagtctc	ttcacgattc
3901	ccgctcataa	cctcgtcggc	gtctagccgg	agaagtaaac	cgggaacggc	gagttcggga
3961	cgcttgtaac	caccaggata	aagagttcgc	ggcctagaag	aagaagtctg	atcgccggat
4021	tcatgcgaaa	tgtttctgat	cgagagagaa	gaaaaacgcc	tatgacgtgg	aggagtataag
4081	gaggataact	taaagcaccg	gccaggaaac	ggtggagatg	cggcggagat	aagaaacggt
4141	gacgtcacac	attgccgggtg	agagattaga	gttctcatgg	agagagaaaag	agagagagtg
4201	agataccttc	gtctgtgttt	ctgattagtt	ttcttatctc	ttaaatatcc	tattggccca
4261	tcccaaagct	ataagacgga	cggcgcgatt	aattactttt	caaacacatg	aattaacggt
4321	ttcacatatg	tgttcatatc	caaaaggtcc	aaagtatacc	acgaaaaggg	agaaaaacag
4381	atttaaattc	gtgaaatccc	tctcccacaa	ttaaatttac	ttcttccaaa	caaagacaaa
4441	cggcttgaac	cagtcaagta	agtgatacgg	caccactaga	tgttccagag	cctccatctt
4501	ttttaatacg	aagaagattt	gtcctttgtg	tgtatgaatt	taacaagttt	taattataga
4561	tttgtgtgtg	tatgaattta	aaaacctagt	acgtagcatc	agggaaatgat	atcatagcta
4621	ttttagttga	gctttcaaact	aagagatgat	caaaatttag	aacttctaag	aacatgaacg
4681	aataaacaac	tattttcttt	tcaaaccaac	taaggtagat	ggtcactgaa	agtatatata
4741	tcagataaaa	gttgcttggt	attccagatg	aagttggacc	gagaaaaaaa	aaagttactt
4801	gttattcaat	atgtttggat	ctttgtcttg	cagattgcta	tatagggttg	ataatgggct
4861	tcggttgtaat	gggtatacac	tgtataagaa	tcggccttgt	gcaaccaatc	ctaatatgtg
4921	tgtctcatta	aggtaagtgc	ttaagatttag	aagagtataa	cacttgactt	atcaactatg
4981	tcaactaagg	gttctatat	tttattaaat	aaaaaataat	tgaatatatt	ttagaatgat
5041	ttaataaatt	taatgctatt	gtttgattta	aatgtataat	tcaccgcgag	aagaaatttt
5101	ataactcaaa	ttttaaggtt	ttaagttgta	tttgtttatt	ttgttaaagt	tttaatatgt
5161	tataattgta	ttttgattgt	tgtttctcgg	atttcacccg	tagtacatca	tcccatatta
5221	atatcgaatc	aaaccgcgtc	attctaaaa	ttcaccgcgtg	gtagtattta	attgtataat
5281	tatattttaa	ttgtcattct	aagatttcac	tcctaattct	atcgcaaatt	attatcaacc
5341	caaaccagtc	aattctaaaa	tatcaccgcgt	agtaaccat	cccatattaa	tatcgaatca
5401	agcccggtcaa	ttctaggatt	tcaccgcgtg	tagtatttaa	ttgtataatt	atattttaatt
5461	tgctattcta	ggatttcact	cctaattcta	tcgcaaatta	ttatcaaccc	aaaccagtc
5521	attctaaaa	atcaccgcgt	gtacaccatc	ccatattaat	atcgattcaa	actcgtcaat
5581	tctaggattt	cgctcgtgg	agtattta	tgtataatta	tatttttaatt	gtcattttta
5641	ctcctagttc	tatcgcaaat	tcttatcaac	ccaaacagtc	aattctaaaa	tttcaccgcgt
5701	agtataaagt	ttaaatatatt	ataatatatta	aatttcttat	aaaagaatca	aaatgtgttt
5761	taaaaaaatt	aaagttttta	gttttttttt	tttaatatgt	tttaatttgt	ttagtgttta
5821	agattatata	attacattat	gattgtcatt	atatgttttt	ctccatagca	tactatccca
5881	tgttattatc	cactcaaacc	tgtcacacca	tataaccccg	tcccggtgaaa	ttaaacacaa
5941	atattgtcatt	ttattataaa	tttcaaata	ttataaaaatt	agaaacttca	aaaaagatta
6001	atattgaccc	aaacttcac	attgaatttt	gagtgttata	tctaagattt	ctctcgcaat

Fig. 21

SEQ ID NO:23

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1 atggaggctc tggaaacatct agtgcttttg gatgggcca taggatattt aagagataag
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121 actetaatct ctcaccggca atgtgtgacg tcaccgtttc ttatctccgc cgcactctcca
181 cggtttcctg gccggtgctt taagttatcc tcctttactc ctccacgtca taggcgtttt
241 tcttctctct cgatcagaaa catttcgcat gaatccgccg atcagacttc ttcttctagg
301 ccgcgaactc tttatctctg tggttacaag cgtcccgaac tcgccgttcc cggtttactt
361 ctccggctag acgccgacga gggtatgagc gggaaatcgtg aagagactct tgatttggtc
421 gaccgtgctt tagctaaatc gggtcaaatc gtcgtgattg atggcggagc caccgctggt
481 aagctctacg aggcggttg tttgctgaaa tcacttgta aaggccgtgc ttacctcttg
541 atcgtgaac gtgttgatat cgctccgcc gttggtgcta gtggtgttg ctcctccgac
601 gaaggctctc cggcgattgt ggcgagaaac acattgatgg gatccaacc cgaactcgga
661 cttcttccac tggtagctcg gattgtgaag gatgttgatt ctgctctaat tgctcaagc
721 tccgagggtg ctgatttctt tatacttgga tctggtgaag aagatacgca agtggcggat
781 tctttgttga agagcgtgaa aataccgata tatgtgactt gcagaggcaa tgaagaagct
841 aaagaagaat tgcagttact gaaatcaggt gttcttggtt ttgttatttc gttgaaagat
901 ttgcgttctt ctagggtatg agctcttcgc cagagtcttg atggagctta tgtgttaaat
961 aatcatgaga caaaaatat gaatgaactg ccggagaaaa agaattctgc tggcttcata
1021 aaattagagg acaaacagaa actaatagta gaaatggaga aatctgtgtt gagagagacg
1081 attgaaatca tccacaaggc ggctccactg atggaggaag tctcccttct aattgatgct
1141 gtttctcgga tcgatgagcc gtttctgatg gttatagtgg gggaaattta ctctgaaaa
1201 tcaacggtta tcaatgcact tcttggaag agatacctga aagaaggggt agtccccact
1261 accaatgaaa tcacgtttct gtgctactct gacttggaat ccgaagagca acaacgttgc
1321 caaacacatc cagatggcca atatataaat attgttgaca cacctgggac caatgtgatc
1381 cttcaaaggc aacagcgtct tacagaagaa tttgtccac gtgcagattt gcttgttttt
1441 gttctttctg ctgaccgccc tttactgaa agtgaggtag aagttaccgt tttacttggc
1501 atggaaggga aagttgtcac taggttgaat gcatatatca aggttgctt tctccggtac
1561 acacagcagt ggaaaaagaa atttgtgttt attctgaata aatctgatat ctatcgtgat
1621 gctcgtgagc ttgaggaagc tatttcattt gttaaagaga atacacggaa gttgcttaat
1681 acagaaaatg tgatattgta tccggtgtcc gcacggtctg ctcttgaggc gaagctttca
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1861 accgggatgg agagaataag gcttaaattg gagacacca tggcgattgc tgagcgtctc
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2221 gcaactacaa atgcgaaaga attgcttgga aaatatgctg aatggctaca atcaaatact
2281 gcccgatgaag ggagtctgtc tctgaaatca ttcgaaaaca aatggccaac atatgtcaat
2341 tcaaaaacgc aattgggcat agacacatat gacttacttc agaaaactga taaagtcagc
2401 ttgaaaacaa tacagaactt gagtgcgga accacatcaa aacgattgga acaagatatt
2461 cgagaagtg
```

Fig. 22

SEQ ID NO:24

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ALAKSVQIVVIDGGATAGKLYEAACLLKSLVKGRAYLLIAERVDIASAVGASGVALSDEGLPAIVARNTLM
GSNPDSVLLPLVARIVKDVDLSALIASSEGADFLILGSGEEDTQVADSLKSVKIPIYVTCRGNEEAKEEL
QLLKSGVSGFVISLKDRLSSRDVALRQSLDGAYVNNHETQNMNELPEKKNSAGFIKLEDKQKLIVEMES
VLRETIEIIHKAAPLMEEVSLIDAVSRIDEPFLMVIVGEFNSGKSTVINALGKRYLKEGVVPTTNEITF
LCYSDLESEEQQRCQTHPDGQYINIVDTPGTNVILQRQQLTEEFVPRADLLVFLSADRPLTESEVEVTV
LLGMEGKVVTRLNAYIKVAFLRYTQQWKKKFVFI LNKSDIYRDARELEEAISFVKENTRKLNTENVILYP
VSARSALEAKLSTASLVGRDDLEIADPGSNWRVQSFNELEKFLYSFLDSSTATGMERIRLKLETPMAIAER
LLSSVEALVRQDCLAAREDLASADKIIISRTKEYALKMEYESISWRRQALSLIDNARLQVVDLIGTTLRLSS
LDLAISYVFKGEKSASVAATSKVQGEILAPALTNAKELLGKYAEWLQSN TAREGSLSLKS FENKWPTYVNS
KTQLGIDTYDLLQKTDKVSLKTIQNLSAGTTSKRLEQDIREV

Fig. 23

SEQ ID NO:25

69061 acaaagacca gttaaaaacg tgtgtagtat aacttactgg taagtaaagc tataagcaag
69121 aatctgtacc ttattttctc tctctctagt gagccctgac catccgaatt tcgcattcgc
69181 caatcgctgt gtttccgtgt gttttccccc tttttggttt tagatttgcc taaaccaatc
69241 agaacaagag aaacctggaa acaagaacca aaaaaagtgg gctttctctg catcatcatt
69301 ccacttctgg tccccactg aaaaggacaa tccaaagcta gatcccttca aattttcctt
69361 tttgttttcg aaattttcgc aatttttaat attattttgg aagtctatgt ttctttctga
69421 tcttttagcaa caaaggaagg tggaaatctgt ttcacgttta cacaaaaaca tgtcaactgg
69481 agattttctc ttccoctaac ttttgaccat acagtatggg ccatacttaa tattctctct
69541 ttgtttttta taaaataaaa gggttggtta tcaagcatat atgtcattag cttaaagcta
69601 tgactttggt tagaaaactt aggaggacca tatggcaagc ttttatacag tgtagactt
69661 ctaacgttaa ttctaaacaa tctccagtat caagcattaa caaggtttat tctagacct
69721 ctggattttt aaaacttctc gaaccaatcc ttaactaaaa aagaaattca agcgttttat
69781 ctttagaaat cacagctagc atatgctgag aattactctc catggaaact tatactaaga
69841 ttgttttttt cctcatatt taagccacta aagtcaaaag attagtacat tgacaactaa
69901 gtttagatgc tctatgcgga gaatcaattt catatgaatg tatcaagcaa ttcatgaact
69961 ctaggagacc ataaaatcca attgacagaa aaaatgagtc aactaacata ttacctgtg
70021 atatgaggta catgtgcagg tcaaagatca gaagaaaatt ttctccatga gtctcttgag
70081 cttccaactc atccagcgat ttgtatcaca aacaatctga aaaagaagct aaaaaacgtt
70141 ataccaaagt ttcacgccc taatgctatt gtttggttct tcaagaacc tccccaatct
70201 tttgaattcg cattcaaaaa aaccatcagt gagtccattt caagtcggaa ctggcaggta
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70321 acccgacatt gtgttggaat agctaaagtc tcatctcgtc tcgtgatata tgaaggttat
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70921 gcaagcaaaa ctcaactatg tcaaaagtgt cacttagatt gattcttgaa tagcgagacg
70981 aagtatctgg gaaaatacgg tactgaatta acatctccgt cagatcatag gttcggattg
71041 aacagatgac acaattaaac aatgatgaag atcaagacac tttaatcgac tgaattc

Fig. 24

AtFzo-like Genomic Sequence

From

F15K9, AC005278:

F10O3, AC006550:

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69001 aaaaactttt caaaacttca tgtgttgtga aaacaaaagt tttttggtta tgaaaactcg
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69121 aatctgtacc ttattttctc tctctctagt gagccctgac catccgaatt tcgcattcgc

69181 caatcgctgt gtttcctgtg tttttccccc tttttggttt tagatttgcc taaaccaatc
69241 agaacaagag aaacctggaa acaagaacca aaaaaagtgg gctttctctg catcatcatt
69301 ccacttcttg tccccactg aaaaggacaa tccaaagcta gatcccttca aattttcctt
69361 tttgttttcg aaattttcgc aatttttaat attattttgg aagtctatgt tctttctga
69421 tctttagcaa caaaggaagg tggaaatctgt ttcacgttta cacaaaaaca tgtcaactgg
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70201 tttgaattcg cattcaaaaa aaccatcagt gagtccattt caagtcggaa ctggcaggta
70261 ttattcatta tgacaaagta catacacttg cccccactg aacaatgtca agaagggaag
70321 acccgacatt gtgttggaat agctaaagtc tcatctcgtc tcgtgataca tgaaggttat

70381 caatatcaac ttgtagcaac tgtaatttac ttctaataac tgataattct tctggattc
70441 ctaaaagacg atcaagtctt agctgagctt ctctcgcata aggccttgga acaatattca
70501 caaagttaac tagattactc gtgcgcatcg aaagatcttt ttgcatagcg tcttcgagct
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70621 ggaagtgttc tatagccaca tacctgtcac atagattatg ttatgcatac aaccagctct
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70801 agcggagcaa aggccaagag caagaagatc ttccagtgtg gtcggtagca ctgagggttag
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901 ccaacgagag agcctgcctt ctccaagaaa tgctctcata ttccatctta agcgcgtatt
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Fig. 24 continued 2/3

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1021 cttgtctcac aagagcttcc acagaagaaa ggagacgctc agcaatcgcc atgggtgtct
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2521 tccatcacaaa aactattttg aatcataaag gcaactgtc ccacttaaaa catcttccaa
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Fig. 24 continued 3/3

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Yeast	Dnmlp	1	-----MAG--LNDLIPVHRLQDVMY-----
ARC5		1	MAEVSASVTVENAEEDDAALERRSLYAEYNELHALAQELETPEAAVAVLQDQOTDUEALVALMGF
Human	Dynam-in-1	64	VYRPLVQLVNATT-----
Yeast	Dnmlp	61	VYRPLVQLNMISPNLSLEDDNSVNPHEVTKISOPHACTIPLEYRCKERNHADKNGEFLHIPQKRY
ARC5		81	KRRPITTHMKYDPCQFP-----LCHLQSDDDPSVSLPK
Human	Dynam-in-1	102	EATDREVGT-NKGIIPVPHLRTSPHVLHVLVLOKTKVYDQ--PPDIEFQIDNMNQVTKKNC
Yeast	Dnmlp	141	ENNTAIAOK-DKGIKIPVPHLRTSPHVLHVLVLOKTKVYDQ--PPDIEKQIKNLIIDYIATPHC
ARC5		125	MAENMLEQEPCCPFAKESVYQYKCPHETITLQIAPAPLNRALQVQARAVEALVRKMQHKE
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Yeast	Dnmlp	218	VDLVNSGLKARVDDQETGVITKEDLMDGTDARDVLEKLLERQYIGVVMRSQKDIDGKEDIT
ARC5		205	SMWSIATTRIVMQDSELSAVSDEGDKIPQFSCSDVEVLSRP-----ASALDSSLELGDSPFP
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Yeast	Dnmlp	298	PRKEPVARTISTKCGTRYAKLQQLSHIRDKKPPDIKTLELTLISQTEQELARYGGVATTHERASLV
ARC5		278	YQDSVTRSHDEPKQAVSRHEDIASLEKLGRLTKQESRIGISKRLFLEHLLVYKRYKESVPLIPL
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Yeast	Dnmlp	378	HFSSIDGTSSDINTKELCG--SARIYIYHVEFGNSKSIDPTSNLSVLDVTAIRMTSPRPTLFVPELA
ARC5		358	RKIDTVSKELSSLEAKKERERTPHDFLTKLKSLLEKGTVAAPPDKPGETLOERTQGFVGTDDGLQFS
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Yeast	Dnmlp	457	KLLPSPQRQCVLXYEELM-----KICHKQGSARLARYPELESMLIYVSELRARLQPTRSYVE
ARC5		438	ELYGGAQYHRAMAEFRFVGAIKCPPITREIYNAGOVEDIHDTNYSRTACVIAVAKAMTPEPFLHQLG
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ARC5		518	LLPISVYLLQKEGHSYLSGHEVFLKRVASAFHSFVSTESTKSCRDCKEDLASTIR-----YVTWLEHNKN
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Yeast	Dnmlp	593	DGIDAKSKQTKDKFLN--YFFGKDK-KGVFVDSADSKRSINGD-----ONIEDFRLQISDFSLGD
ARC5		591	SPGQTEHNTSGNATQPSLPQDALGGTTDTSSRSBVKLSHLNIDSGSSIOTTENRLADLDSLTWNRKL
Human	Dynam-in-1	645	DSFPHSNDPQLERQVETIENLVDSYHAYNKTVDRLKPKTIMHLMINNTKEFIPSELLANFSCODQNTM
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ARC5		668	-----IVYALVQQIFQIGIREYFLASAEKFNCFPLMPIVDKLPALLRELEHAFEDDMSIPDITHR
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ARC5			-----

Fig. 25

15/

FIG. 26

ARC5 Homologous Sequences

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ACCESSION BQ860973
VERSION BQ860973.1 GI:22246438
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SOURCE Lactuca sativa
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asterids; campanulids; Asterales; Asteraceae; Cichorioideae;
Cichorieae; Lactuca.
REFERENCE 1 (bases 1 to 712)
AUTHORS Kozik,A., Micheltmore,R.W., Knapp,S., Matvienko,M., Rieseberg,L.,
Lin,H., van Damme,M., Lavelle,D., Chevalier,P., Ziegler,J., Ellison
,P., Kolkman,J., Slabaugh,M.S., Livingston,K., Zhou,Y., Lai,Z.,
Church,S., Jackson,L. and Bradford,K.
TITLE Lettuce and Sunflower ESTs from the Compositae Genome Project
http://compgenomics.ucdavis.edu/
JOURNAL Unpublished
COMMENT Contact: Alexander Kozik [R.W.Micheltmore]
Department of Vegetable Crops, R.W.Micheltmore Lab
University of California at Davis (UCD)
Asmundson Hall, UCD, Davis, CA 95616, USA
Tel: 1-(530)-742-1742
Fax: 1-(530)-752-9659
Email: akozik@atgc.org [micheltmore@vegmail.ucdavis.edu]
singleton, see http://cgpdb.ucdavis.edu/
for
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FEATURES Location/Qualifiers

Fig. 26 continued 2/9

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            Separate cDNAs were generated using primers that
            incorporated unique 5' and 3' tags to distinguish each
            source of RNA. cDNAs were then pooled, size-fractionated,
            directionally cloned into a custom medium-copy vector and
            transformations made with four size classes to minimize
            size bias. Details of each source of RNA and library
            construction can be obtained at <A href="http://cgpdb.ucdavis.edu/">
http://cgpdb.ucdavis.edu/</A>/
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Fig. 26 continued 3/9

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truncatula</A>
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          Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; rosids
          ; eurosids I; Fabales; Fabaceae; Papilionoideae; Trifolieae;
          Medicago.
REFERENCE 1 (bases 1 to 666)
AUTHORS   Torres-Jerez,I., Scott,A.D., Harris,A.R., Gonzales,R.A., Bell,C.J.,
          Flores,H.R., Inman,J.T., Weller,J.W. and May,G.D.
TITLE     Expressed Sequence Tags from the Samuel Roberts Noble Foundation
          Medicago truncatula leaf library
JOURNAL   Unpublished
COMMENT   Contact: May GD
          Plant Biology Division
          The Samuel Roberts Noble Foundation
          2510 Sam Noble Parkway, Ardmore, OK 73402, USA
          Tel: 580 221 7391
          Fax: 580 221 7380
          Email: <A href="mailto:gdmay@noble.org">gdmay@noble.org</A>
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Fig. 26 continued 4/9

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Fig. 26 continued 5/9

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truncatula</A>
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            Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; rosids
            ; eurosids I; Fabales; Fabaceae; Papilionoideae; Trifolieae;
            Medicago.
REFERENCE  1 (bases 1 to 663)
AUTHORS   Torres-Jerez,I., Scott,A.D., Harris,A.R., Gonzales,R.A., Bell,C.J.,
            Flores,H.R., Inman,J.T., Weller,J.W. and May,G.D.
TITLE     Expressed Sequence Tags from the Samuel Roberts Noble Foundation
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JOURNAL   Unpublished
COMMENT   Contact: May GD
            Plant Biology Division
            The Samuel Roberts Noble Foundation
            2510 Sam Noble Parkway, Ardmore, OK 73402, USA
            Tel: 580 221 7391
            Fax: 580 221 7380
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Fig. 26 continued 6/9

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(Stratagene) and packaged using the Gigapack III Gold
packaging extracts. Phagemids containing cDNA inserts were
in vivo excised from the recombinant Uni-ZAP XR vector
using ExAssist helper phage and the E. coli strain
XL1-Blue MRF' (Stratagene). Excised plasmids were plated
using SOLR cells."

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AUTHORS Callahan,A., Palmer,M., Main,D., Wing,R. and Abbott,A.
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TITLE Peach Model Genome for Rosaceae
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JOURNAL Unpublished
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```
COMMENT Contact: Abbott, A.
```

```
Dept of Genetics and Biochemistry
```

```
Clemson University
```

```
122 Long Hall, Clemson University, Clemson, SC 29634, USA
```

```
Tel: 864 656 3060
```

```
Fax: 864 656 6879
```

```
Email: <A href="mailto:aalbert@clemson.edu">aalbert@clemson.edu</A>
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source 1..622
```

```
/organism="Prunus persica"
```

```
/mol_type="mRNA"
```

Fig. 26 continued 8/9

```

/cultivar="Loring"
/db_xref="<A href="
http://www.ncbi.nlm.nih.gov/htbin-post/Taxonomy/wgetorg?id=3760">taxon:3760</A>"
/clone="PP_LEa0022H05f"
/tissue_type="Mesocarp"
/lab_host="E. coli"
/clone_lib="Peach developing fruit mesocarp"
/note="Vector: pBluescript II SK(-); Site_1: EcoRI;
Site_2: XhoI; authority=Prunus persica L. Batsh; The
sequence has been trimmed to remove vector sequence and
contains a minimum of 100 bases of phred value 20 or
above. For more details on library preparation and
sequence analysis go to
<A href="http://www.genome.clemson.edu/projects/peach">
http://www.genome.clemson.edu/projects/peach</A>. To order
this clone go to <A href="http://www.genome.clemson.edu/orders">
http://www.genome.clemson.edu/orders</A>"
BASE COUNT 168 a 125 c 147 g 181 t 1 others
ORIGIN

```

```

1 gcttataacct aacgcaggaa tgcgtttata tgggtggtgca caataccacc gtgccatggc
61 tgagtccgc ttttagttg gaggaataaa atgccctcca attacaaggg aagaaattgt
121 aaatgcatgt ggagtgaag attacatga tggcacaac tactcaagga cagcttgtgt
181 aatagccgtt gcaaaggccc gtgatacatt tgagccttct cttcatcagt taggtttag
241 actcttgac attctaaga gattacttcc tatatcagtc tatcttctc agaaagatgg
301 tgagtattta agtggccatg aggtgtttct taggcgtgtt gcttctgctt tcaatgactt
361 tgcagaatct accgaaaggg catgtcgtga aaaatgcatg gaggatttag taagcaccac
421 ccgctatgtc acctgggtccc ttcacaaca gaatcgagct gggttacgtc aatttttaga
481 ctggttcgct ggaacagaac ataacactat gggtagtaat tgcgtacctg ctggtatttc
541 ccaagattca tcctttgggt ctgttgccaa tgagaaggat actaagtcaa gggcagatgt
601 gaagctcanc catgtggcgt ct

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FIG. 27

Fzo-like Homologous Sequences

1: BG890612. EST516463 cSTD So...[gi:14267734]

LOCUS BG890612 752 bp mRNA linear EST 07-MAR-2003

DEFINITION EST516463 cSTD Solanum tuberosum cDNA clone cSTD19A23 5' sequence,
mRNA sequence.

ACCESSION BG890612

VERSION BG890612.1 GI:14267734

KEYWORDS EST.

SOURCE Solanum tuberosum (potato)

ORGANISM Solanum tuberosum

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
asterids; lamiids; Solanales; Solanaceae; Solanum.

REFERENCE 1 (bases 1 to 752)

AUTHORS van der Hoeven,R., Bezzerides,J., Ewing,E., Cho,J., Chierning,A.,
Bougri,O., Buell,C.R., Ronning,C., Tanksley,S. and Baker,B.

TITLE Generations of ESTs from dormant potato tubers

JOURNAL Unpublished

COMMENT Contact: Robin Buell

The Institute for Genomic Research

9712 Medical Center Dr, Rockville, MD 20850, USA

Email: potato-array@tigr.org

This clone can be obtained from the University of Arizona Genomics
Institute. Orders can be made through URL:

<http://genome.arizona.edu/orders/>

Seq primer: M13F-R.

FEATURES Location/Qualifiers

source 1..752

/organism="Solanum tuberosum"

/mol_type="mRNA"

/cultivar="Kennebec"

/db_xref="taxon:4113"

/clone="cSTD19A23"

/tissue_type="dormant tuber"

/dev_stage="one month post-harvest"

/lab_host="SOLR"

/clone_lib="cSTD"

/note="Vector: pBluescript SK(-); Site_1: EcoRI; Site_2:

XhoI; This library targets genes expressed in dormant

tubers. This library was made from sections of dormant

tuber, avoiding the buds and epidermis. Tubers were stored

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Fig. 27, continued 2/6

for one month post-harvest at 40C. The tuber was peeled, well away from the surface. Then it was chopped into 1-2 mm cubes and immediately frozen in liquid nitrogen. This library is noted as P4 in Tanksley lab notebooks."

BASE COUNT 226 a 144 c 172 g 210 t

ORIGIN

```
1 gcgaatgtga ttctcaaag gcaacaaagg ctgacggagg aatttggcc tcgtgcagat
61 ctgcttctgt ttctcatgct tgctgatcga ccattaactg aaagtgaggt tagtttctg
121 cgttacactc agcagtgagg taagaaggct attttgtgc tgaacaagtc tgacatatac
181 aagaataacg gcgagttgga ggaggccatt gcattatca aagaaaatac acggaaattg
241 ctgaatacag aatccgtaac actgtatcca gtatctgcac ggctcgctct tgaatcaaag
301 ctttctactt ttgatgggct ccttagtcaa aacaatggga gttcaataa tgattctcac
361 tggaaaacca agagcttcta tgagcttgag aagtacttgt ctgcttttt ggattcatcc
421 acaagtactg gaattgagag aatgaagctg aagcttgaaa ctccaattgc cattgcagaa
481 caactacttt tagcttgta aggactgtg agacaagaat gtcagcaagc caaacaagac
541 ttgctgtttg ttgaggatct tgtcaacagc gtagaagagt gcacaaagaa gctggaagtt
601 gatagcattc tgtggaagag gcaggttcta tctctgataa actctgctca agcacgtgtt
661 gtccggcttg tagagtcaac gttacaactg tcaaatgttg atctgtcgc tacatatgta
721 ttcagaagag aaaactctac tcaaatgcc a gc
```

//

2: AW760673. sl53d10.y1 Gm-c10...[gi:7692570]

Links

LOCUS AW760673 492 bp mRNA linear EST 03-DEC-2001
DEFINITION sl53d10.y1 Gm-c1027 Glycine max cDNA clone GENOME SYSTEMS
CLONE ID:

Gm-c1027-5036 5' similar to SW:YOR6_CALSR P40983 HYPOTHETICAL
PROTEIN IN XYNA 3'REGION ;, mRNA sequence.

ACCESSION AW760673

VERSION AW760673.1 GI:7692570

KEYWORDS EST.

SOURCE Glycine max (soybean)

ORGANISM Glycine max

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; rosids
; eurosids I; Fabales; Fabaceae; Papilionoideae; Phaseoleae;
Glycine.

REFERENCE 1 (bases 1 to 492)

AUTHORS Shoemaker,R., Keim,P., Vodkin,L., Erpelding,J., Coryell,V., Khanna
,A., Bolla,B., Marra,M., Hillier,L., Kucaba,T., Martin,J., Beck,C.,
Wylie,T., Underwood,K., Steptoe,M., Theising,B., Allen,M., Bowers
,Y., Person,B., Swaller,T., Gibbons,M., Pape,D., Harvey,N., Schurk
,R., Ritter,E., Kohn,S., Shin,T., Jackson,Y., Cardenas,M., McCann
,R., Waterston,R. and Wilson,R.

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Fig. 27, continued 3/6

TITLE Public Soybean EST Project
JOURNAL Unpublished
COMMENT Contact: Shoemaker R/Public Soybean EST Project
Public Soybean EST Project
Washington University School of Medicine
4444 Forest Park Parkway, Box 8501, St. Louis, MO 63108, USA
Tel: 314 286 1800
Fax: 314 286 1810
Email: est@watson.wustl.edu
This clone is available through: ResGen, Invitrogen Corp. 2130
South Memorial Parkway Huntsville, AL 35801 For further information
call: (800)-533-4363 or contact via email: ccu@resgen.com
Insert Length: 2209 Std Error: 0.00-
High quality sequence stop: 411.
FEATURES Location/Qualifiers
source 1..492
/organism="Glycine max"
/mol_type="mRNA"
/db_xref="taxon:3847"
/clone="GENOME SYSTEMS CLONE ID: Gm-c1027-5036"
/tissue_type="cotyledons of 3- and 7-day-old Williams
seedlings"
/lab_host="DH10B"
/clone_lib="Gm-c1027"
/note="Vector: pBluescript II SK+; Site_1: EcoRI; Site_2:
XhoI; This cDNA library was constructed from mRNA isolated
from cotyledons of 3- and 7-day-old Williams seedlings
which were propagated on paper towels with distilled
water. The cotyledons were flash-frozen in liquid
nitrogen, then lyophilized for 72 hours. Unequal amounts
of mRNA was used for cDNA synthesis. Stratagene's cDNA
Synthexix Kit (catalog number 200401) was used to
synthesize the cDNA. First- stranded synthesis was
performed with 5-methyl dCTP, hence the ligated cDNA was
hemimethylated. A modification of Stratagene's
first-strand synthesis primer was used. An anchor
nucleotide (V=A, C, or G) was added to the 3' end of the
primer [GAGAGAGAGAGAGAGAGAGAACTAGTCTCGAG(T)18] to anchor
the primer at the 5' end of the poly(A) tract. After
second- strand synthesis, the cDNA ends were filled in
with cloned Pfu DNA, ligated to EcoRI adapters and
subsequently phosphorylated. The XhoI site within the
first-strand synthesis primer was then restricted by
digestion with XhoI; all XhoI sites in the cDNA would be
protected by their hemimethylated status. The cDNA
constructs were size-fractionated with a 500 bp cutoff,

Fig. 27, continued 4/6

using GibcoBRL Life Technologies' cDNA Size Fractionation column. The column eluent was then ligated into Stratagene's pBluescript(tm) II XR Predigested vector (pBluescript II SK(+)) that has been digested with EcoRI and XhoI, and phosphorylated by Stratagene). 97% of the white and blue colonies appear to contain recombinant plasmids with cDNA inserts, based on size (n=30). This library was constructed by Dr. Paul Keim and Dr. Virginia Coryell."

BASE COUNT 135 a 91 c 108 g 158 t

ORIGIN

```
1 tgttgatga agctattgaa gctatcaaga gggctgcacc tctgatggag gaggtttcac
61 ttcttaatga tgcggtttct caaattgatg agccattctt actggttata gtgggggaat
121 tcaactctgg taaatctacc gtgattaatg cgcttcttgg agaaagatat ctcaaagagg
181 gagttgttcc aacaactaat gagatcacat ttttacgata tactgactta gatattgaac
241 aacaacggtg tgaaggcat ccagatggcc aatatatttg ctacattcct gtcceaattc
301 ttaagagat gaccattgtt gatacacctg gaactaatgt gattcttcag aggcagcagc
361 gtcttacaga ggaatttga ccccgtcgag atttacttct tttgtcatt tctgctgate
421 gccctttaac tggaagtgag attgcttttc ttcgttattc tcagcagtgg aaaaagaaag
481 cggcttttgt ct
```

//

3: BE353824. EST355167 tomato ...[gi:9291800]

Links

LOCUS BE353824 446 bp mRNA linear EST 18-MAY-2001

DEFINITION EST355167 tomato flower buds, anthesis, Cornell University

Lycopersicon esculentum cDNA clone cTOD6M4, mRNA sequence.

ACCESSION BE353824

VERSION BE353824.1 GI:9291800

KEYWORDS EST.

SOURCE Lycopersicon esculentum (tomato)

ORGANISM Lycopersicon esculentum

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;

Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;

asterids; lamiids; Solanales; Solanaceae; Solanum; Lycopersicon.

REFERENCE 1 (bases 1 to 446)

AUTHORS van der Hoeven,R.S., Bezzeredes,J.L., Matern,A.L., Holt,I.E., Liang

,F., Hansen,T.S., Craven,M.B., Bowman,C.L., Ronning,C.M., Nierman

,W., Fraser,C.M., Martin,G.B., Giovannoni,J.J. and Tanksley,S.D.

TITLE Generation of ESTs from tomato flower tissue, anthesis

JOURNAL Unpublished

COMMENT Contact: CUGI

Clemson University Genomics Institute

Clemson University

Fig. 27, continued 5/6

100 Jordan Hall, Clemson, SC 29634, USA
Email: <http://www.genome.clemson.edu/orders/index.html>
5 prime sequence.

FEATURES Location/Qualifiers
source 1..446
 /organism="Lycopersicon esculentum"
 /mol_type="mRNA"
 /cultivar="TA496"
 /db_xref="taxon:4081"
 /clone="cTOD6M4"
 /tissue_type="flower"
 /dev_stage="anthesis"
 /clone_lib="tomato flower buds, anthesis, Cornell
 University"
 /note="Vector: pBlueScript SK(-); Site_1: EcoR1; Site_2:
 Xho1; supplier: Tanksley; Flower buds and flowers were
 taken from greenhouse plants (4-8 wks old, TA496). They
 were immediately frozen in liquid nitrogen and then
 size-separated while remaining frozen."
BASE COUNT 119 a 82 c 116 g 129 t
ORIGIN
 1 gagaccatta agtacaattc tataagcagt cttttgaaaa aagatggact tcattggtga
 61 atccgtctga ccaaattgag ttaggaacaa ctggtgtgct ggatagaaaa tctgaagta
 121 ccataagtgt catagaggat ttcagtgtcg cagctgcttc aaaattgctt gagagagata
 181 ttctgaagt gttcttgggt acctttgggt gtcttggagc agctggttta tcagcgtcgc
 241 ttctgacatc tgttctcaa accacattag aagacctctc tgcacttggc ctttgttctg
 301 ctggcgggtt attagcggtc ttcaactctc catcccgag acagcaagtg gtagataaag
 361 taaagaggac tgcgatggc ctttcacgtg aactogaaga ggctatgcag aaggagctct
 421 tggagacgac tagtaatgtg gaggac

//

4: BI136291. F066P17Y Populus ...[gi:18017219]

Links

LOCUS BI136291 521 bp mRNA linear EST 31-DEC-2001
DEFINITION F066P17Y Populus flower cDNA library Populus balsamifera subsp.
 trichocarpa cDNA, mRNA sequence.
ACCESSION BI136291
VERSION BI136291.1 GI:18017219
KEYWORDS EST.
SOURCE Populus balsamifera subsp. trichocarpa
ORGANISM Populus balsamifera subsp. trichocarpa
 Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
 Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; rosids
 ; eurosids I; Malpighiales; Salicaceae; Populus.

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Fig. 27, continued 6/6

REFERENCE 1 (bases 1 to 521)

AUTHORS Hertzberg,M., Aspeborg,H., Erlandsson,R., Bjorkbacka,H., Hiltonen
,T., Karlsson,J., Teeri,T., Gustafsson,P., Bahlerao,R., Jansson,S.,
Nilsson,O., Sundberg,B., Nilsson,P., Uhlen,M., Sandberg,G. and
Lundeberg,J.

TITLE Gene expression in Populus

JOURNAL Unpublished

COMMENT Contact: Erlandsson R

Department of Biotechnology

Royal Institute of Technology

Teknikringen 30, Stockholm S-10044, Sweden

Tel: 46 8 790 8287

Fax: 46 8 245452

Email: rikerl@biochem.kth.se.

FEATURES Location/Qualifiers

source 1..521

/organism="Populus balsamifera subsp. trichocarpa"

/mol_type="mRNA"

/sub_species="trichocarpa"

/db_xref="taxon:3694"

/clone_lib="Populus flower cDNA library"

/note="Organ: flower"

BASE COUNT 143 a 87 c 135 g 156 t

ORIGIN

1 tgggtgtgtg ctgtctgac aagggtctcc tgccctgtg gcaagaaata tgatgatggg
61 ttctgaaact gaatcagttg ttctacctt ggtagccagg attgtgcaga caccatatgc
121 tgcattaaat gcgtctaatt ctgaaggtgc tgattttctt atatatgttc atggcccaga
181 ggatgacct gatgtagaaa tgagccctgg attcgggaat gtgaagatac caatctttgt
241 cctcaatgct tcacgtgggg aggacacatt gtcggtgggg gcatcaaaat ttctgaaaac
301 cgggtgtagt ggtttagttc tgcattgga agattgagg ttatttagcg atgatgcttt
361 gaggcagatg ttgacactc tgagtgaac cggtaaaaac tticaggatg acctgaaag
421 cttcagtaag ctcaaatcta tggatatgga aaatgatatt catgaaaaaa caacggtggc
481 aggcctttgt aaactggagg atagagaaaa acagctcata g